



**CONTRACT DOCUMENTS
AND
SPECIFICATIONS**

DIVISION OF PARKS AND RECREATION

FOR

**Phoenix Park Reimagined Construction
Project**

Bid No. 24-2024

Prepared by: Element Design

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PART 1

ADVERTISEMENT FOR BIDS

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PART 1

ADVERTISEMENT FOR BIDS

1. INVITATION

Sealed proposals for the **Phoenix Park Reimagined Construction Project** will be received by the Lexington-Fayette Urban County Government (LFUCG) via Ion Wave until 2:00 p.m., local time, **May 6, 2024**, for furnishing all labor and/or materials and performing all work as set forth by this advertisement, Ion Wave Q&A, conditions (general and special), specifications, and/or the drawings prepared by Element Design for Lexington-Fayette Urban County Government. Immediately following the scheduled closing time for reception of bids, all proposals which have been submitted in accordance with the above will be opened electronically and a bid tab sheet will be posted via Ion Wave.

LFUCG will only be accepting bids on-line through Ion Wave for this solicitation. Base bid and alternate totals (if required) should be provided on the appropriate line items tab on Ion Wave. Submissions without line item totals (if required) may be rejected and deemed non-responsive. All forms normally provided with bid submission should be downloaded from Ion Wave, filled out and attached with bid submission. A copy of bid bond must be included with submission. THESE INSTRUCTIONS SUPERCEDE ALL OTHER BID SUBMISSION INSTRUCTIONS PROVIDED IN THIS PACKAGE. PLEASE SUBMIT ALL QUESTIONS VIA THE Q&A MODULE ON ION WAVE.

2. DESCRIPTION OF WORK

Consisting of the construction and/or furnishing of items as listed in the Bid Schedule beginning on page P-6, Part III, Form of Proposal, of this document, for the Phoenix Park Reimagined Construction Project, Lexington-Fayette County, Kentucky.

Specs and drawings are available on Ion Wave only.

3. OBTAINING PLANS, SPECIFICATIONS, AND BID DOCUMENTS

Plans, Specifications, and Contract Documents shall be obtained from Ion Wave (LFUCG's electronic bidding system). Ion Wave can be accessed at <https://lexingtonky.ionwave.net>

4. METHOD OF RECEIVING BIDS

Bids will be received from Prime Contracting firms on a **Lump Sum** for total Project. Bidder must include a price for all bid items to be considered. **Bids shall be submitted in the manner and subject to the conditions as set forth and described in the Information for Bidders and Special Conditions.**

Bids/proposals should be submitted online via Ion Wave.

5. METHOD OF AWARD

The Contract, if awarded, will be to the lowest responsive and responsible bidder for the total project whose qualifications indicate the award will be in the best interest of the OWNER and whose bid/proposal complies with all the prescribed requirements. No Notice of Award will be given until the OWNER has concluded such investigation as deemed necessary to establish the responsibility, qualifications and financial ability of Bidders to do the work in accordance with the Contract Documents to the satisfaction of the OWNER within the time prescribed. The OWNER reserves the right to reject the Bid of any Bidder who does not pass such investigation to the OWNER's satisfaction. The OWNER reserves the right to reject the Bid of any Bidder that is deemed to be unbalanced or front loaded. In analyzing Bids, the OWNER may take into consideration alternate and unit prices, if requested by the Bid forms.

6. BID WITHDRAWAL

No bidder may withdraw his bid for a period of ninety (90) calendar days after the closing date for receipt of bids. Errors and omissions will not be cause for withdrawal of bid without forfeit of bid bond.

7. BID SECURITY

If the bid is \$50,000 or greater, bid shall be accompanied by a certified check or bid bond payable to the Lexington-Fayette Urban County Government in an amount not less than Five Percent (5%) of the base bid. Bid bond shall be executed by a Surety Company authorized to do business in the Commonwealth of Kentucky and countersigned by a licensed Kentucky Resident Agent, representing the Surety Company. Bid Bonds are not required for bids under \$50,000. A cashier's check or irrevocable letter of credit is an acceptable form of bid security.

8. SUBMISSION OF BIDS

CONTRACTORS shall submit their bids via Ion Wave not later than 2:00 p.m. local time, **May 6, 2024**. Bid submittals and bid tab sheet will be immediately available after bid opening.

9. RIGHT TO REJECT

The Lexington-Fayette Urban County Government reserves the right to reject any and all bids and to waive all informalities and/or technicalities where the best interest of the Lexington-Fayette Urban County Government may be served.

10. NOTIFICATION TO THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT FOR AFFIRMATIVE ACTION PLAN AND CURRENT WORKFORCE

The successful bidder must submit the following to the Lexington-Fayette Urban County Government:

1. Affirmative Action Plan for his/her firm.
2. Current Workforce Analysis Form

Failure to submit this as required herein may result in disqualification of the Bidder from the award of the contract.

11. NOTICE CONCERNING MWDBE and Veteran Goals

Notice of requirement for Affirmative Action to ensure Equal Employment Opportunities and Disadvantaged Business Enterprises (DBE) Contract participation. Disadvantaged Business Enterprises (DBE) consists of Minority-Owned Business Enterprises (MBE) and Woman-Owned Business Enterprises (WBE).

The Lexington-Fayette Urban County Government has set a goal that not less than ten percent (10%) of the total value of this Contract be subcontracted to Disadvantaged Business Enterprises, which is made up of MBEs and WBEs, and set a goal that not less than three percent (3%) of the total value of this Contract be subcontracted to Veteran-Owned Small Businesses. The goals for the utilization of Disadvantaged Business Enterprises and Veteran-Owned Small Businesses as subcontractors are recommended goals. Contractor(s) who fail to meet such goals will be expected to provide written explanations to the Director of the Division of Purchasing of efforts they have made to accomplish the recommended goal, and the extent to which they are successful in accomplishing the recommended goal will be a consideration in the procurement process. Depending on the funding source, other DBE goals may apply.

For assistance in locating Disadvantaged Business Enterprise and Veteran-Owned Small Businesses as Subcontractors contact:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, 3rd Floor, Room 338
Lexington, Kentucky 40507
859-258-3323
smiller@lexingtonky.gov

12. AMERICAN RESCUE PLAN ACT

AMENDMENT 1 — CERTIFICATION OF COMPLIANCE FOR EXPENDITURES USING FEDERAL FUNDS, INCLUDING THE AMERICAN RESCUE PLAN ACT

The Lexington-Fayette Urban County Government (“LFUCG”) may use Federal funding to pay for the goods and/or services that are the subject matter of this bid. That Federal funding may include funds received by LFUCG under the American Rescue Plan Act of 2021. Expenditures using Federal funds require evidence of the contractor’s compliance with Federal law. Therefore, by the signature below of an authorized company representative, you certify that the information below is understood, agreed, and correct. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

The bidder (hereafter “bidder,” or “contractor”) agrees and understands that in addition to all conditions stated within the attached bid documents, the following conditions will also apply to any Agreement entered between bidder and LFUCG, if LFUCG uses Federal funds, including but not limited to funding received by LFUCG under the American Rescue Plan Act (“ARPA”), toward payment of goods and/or services referenced in this bid. The bidder also agrees and understands that if there is a conflict between the terms included elsewhere in this Request for Proposal and the terms of this Amendment 1, then the terms of Amendment 1 shall control. The bidder further certifies that it can and will comply with these conditions, if this bid is accepted and an Agreement is executed:

1. Any Agreement executed as a result of acceptance of this bid may be governed in accordance with 2 CFR Part 200 and all other applicable Federal law and regulations and guidance issued by the U.S. Department of the Treasury.
2. Pursuant to 24 CFR § 85.43, any Agreement executed as a result of acceptance of this bid can be terminated if the contractor fails to comply with any term of the award. This Agreement may be terminated for convenience in accordance with 24 CFR § 85.44 upon written notice by LFUCG. Either party may terminate this Agreement with thirty (30) days written notice to the other party, in which case the Agreement shall terminate on the thirtieth day. In the event of termination, the contractor shall

be entitled to that portion of total compensation due under this Agreement as the services rendered bears to the services required. However, if LFUCG suspects a breach of the terms of the Agreement and/or that the contractor is violating the terms of any applicable law governing the use of Federal funds, LFUCG may suspend the contractor's ability to receive payment by giving thirty (30) days' advance written notice. Further, either party may terminate this Agreement for cause shown with thirty (30) days written notice, which shall explain the party's cause for the termination. If the parties do not reach a settlement before the end of the 30 days, then the Agreement shall terminate on the thirtieth day. In the event of a breach, LFUCG reserves the right to pursue any and all applicable legal, equitable, and/or administrative remedies against the contractor.

3. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

- (1) Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the

administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part, and the contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Provided, however, that in the event a contractor becomes involved in or is threatened with litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

4. If fulfillment of the contract requires the contractor to employ mechanic's or laborers, the contractor further agrees that it can and will comply with the following:

- (1) Overtime requirements: No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such a workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such a workweek.
- (2) Violation: liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. LFUCG shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work

Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

- (4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower-tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.
5. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.
6. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.
7. The contractor shall include these requirements in numerical paragraphs 5 and 6 in each subcontract exceeding \$100,000 financed in whole or in part with Federal funding.
8. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.
9. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.
10. The contractor shall include these requirements in numerical paragraphs 8 and 9 in each subcontract exceeding \$100,000 financed in whole or in part with Federal funds.
11. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.
12. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency regional office.
13. The contractor shall include these requirements in numerical paragraphs 11 and 12 in each subcontract exceeding \$100,000 financed in whole or in part with American Rescue Plan Act funds.
14. The contractor shall include this language in any subcontract it executes to fulfill the terms of this bid: "the sub-grantee, contractor, subcontractor, successor, transferee, and assignee shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by

the Department of the Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract (or agreement). Title VI also includes protection to persons with 'Limited English Proficiency' in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d et seq., as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, and herein incorporated by reference and made a part of this contract or agreement."

15. Contractors who apply or bid for an award of \$100,000 or more shall file the required certification that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency. Each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier, up to the recipient. The required certification is included here:

- a. The undersigned certifies, to the best of his or her knowledge and belief, that:
 - (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
 - (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.
- b. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

16. The contractor acknowledges and certifies that it has not been debarred or suspended and further acknowledges and agrees that it must comply with regulations regarding debarred or suspended entities in accordance with 24 CFR § 570.489(1). Funds may not be provided to excluded or disqualified persons.

17. The contractor agrees and certifies that to the greatest extent practicable, it will prefer the purchase, acquisition, and use of all applicable goods, products or materials produced in the United States, in conformity with 2 CFR 200.322 and/or section 70914 of Public Law No. 117-58, §§ 70901-52, also known as the Infrastructure Investment and Jobs Act, whichever is applicable.

18. The contractor agrees and certifies that all activities performed pursuant to any Agreement entered as a result of the contractor's bid, and all goods and services procured under that Agreement, shall comply with 2 C.F.R. § 200.216 (Prohibition on certain telecommunications and video surveillance services and equipment) and 2 C.F.R. 200 § 200..323 (Procurement of recovered materials), to the extent either section is applicable.

19. If this bid involves construction work for a project totaling \$10 million or more, then the contractor further agrees that all laborers and mechanics, etc., employed in the construction of the public facility project assisted with funds provided under this Agreement, whether employed by contractor, or contractor's contractors, or subcontractors, shall be paid wages complying with the Davis-Bacon Act (40 U.S.C. 3141-3144). Contractor agrees that all of contractor's contractors and subcontractors will pay laborers and mechanics the prevailing wage as determined by the Secretary of Labor and that said laborers and mechanics will be paid not less than once a week. The contractor agrees to comply with the Copeland Anti- Kick Back Act (18 U.S.C. § 874) and its implementing regulations of the U.S. Department of Labor at 29 CFR part 3 and part 5. The contractor further agrees to comply with the applicable provisions of the Contract Work Hours and Safety Standards Act (40 U.S.C. Section 327-333), and the applicable provisions of the Fair Labor Standards Act of 1938, as amended (29 U.S.C. et seq.). Contractor further agrees that it will report all suspected or reported violations of any of the laws identified in this paragraph to LFUCG.

Signature

Date

13. PRE-BID CONFERENCE

A pre-bid conference is scheduled for April 23, 2024, 1:00 pm, at 469 Parkway Dr, Lexington, KY.

END OF SECTION

PART II
INFORMATION FOR BIDDERS

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PART II

INFORMATION FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS

The Lexington-Fayette Urban County Government (herein called the OWNER) invites bids from firms on the project described in the Advertisement for Bids. The OWNER will receive bids via Ion Wave, at the time and in the manner set forth in the Advertisement for Bids, and the Bids. The OWNER may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 90 days after the actual time and date of the bid opening, but OWNER may, in its sole discretion, release any bid and return the Bid Security prior to that date.

The Lexington-Fayette Urban County Government assumes no responsibility for bids that are not delivered as indicated above.

2. PREPARATION OF BID

The bid must be submitted with the entire proposal and include all pages. All blank spaces for the bid prices must be filled in, either in ink or typewritten, for both unit prices and extensions. Totals for each bid item must be added to show the total amount of the bid.

3. REQUIRED BONDS

The bonds required for this project are bid bond and performance and payment bond.

4. SUBCONTRACTS

The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this Contract must be acceptable to the OWNER. All proposed subcontractors must be identified on the Form of Proposal. Prior to the award of Contract, the OWNER or the OWNER'S representative will advise the CONTRACTOR of the acceptance and approval thereof or of any action necessary to be taken. Should any Subcontractor be rejected by the OWNER, the CONTRACTOR shall present a new name and/or firm to the OWNER at no change in the Contract Price.

5. QUALIFICATION OF BIDDER

The OWNER may make such investigations as the OWNER deems necessary to determine the ability of the bidder to perform the Work, and the bidder shall furnish to the OWNER all such information and data for this purpose as the OWNER may request.

The OWNER reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the OWNER that such bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein. Conditional bids will not be accepted.

In evaluating Bids, OWNER shall consider the qualifications of the BIDDERS, whether or not the Bids comply with the prescribed requirements, and alternatives and unit prices, as requested. OWNER may consider maintenance requirements, performance data, and disruption or damage to private property. It is OWNER'S intent to accept alternatives by the bid forms, in the order in which they are listed in the Bid Form but OWNER may accept or decline them in order or combination. The contract, if awarded, will be awarded to the lowest responsive and qualified, responsible BIDDER based upon OWNER'S evaluation which indicates that the award will be in the best interest of OWNER and the general public.

In the event there is any question as to the bidder's qualifications and ability to complete the work, a final determination will be made in accordance with a fair evaluation by the Urban County Government of the above listed elements.

- A. If the OWNER requires filling out a detailed financial statement, the bidder may provide its current certified financial statement(s) for the required time interval.
- B. Corporate firms are required to be registered with the Office of the Secretary of State, Commonwealth of Kentucky.
- C. Documents Required of CONTRACTOR - (1) A sworn statement signed by the President or owner of the Company regarding all current work in progress anywhere; (2) A document showing the percent of completion of each project and the total worth of each project; and (3) Documentation showing the percentage of the DBE employment levels on each project of the Bidder's current work force, and DBE participation levels for Subcontractors.
- D. Optional OWNER Requirements - The OWNER, at its discretion, may require the BIDDER/CONTRACTOR to provide: (1) A current detailed financial statement for a period including up to 3 prior years. (2) Financial security or insurance in amounts and kinds acceptable to the OWNER to meet the financial responsibility requirements for the CONTRACTOR to indemnify the OWNER. (3) Additional information and/or DBE work force data, as well as DBE participation data.

Each bidder agrees to waive any claim it has or may have against the Owner and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

6. BID SECURITY

- A. Each bid must be accompanied by a bid bond prepared on a Form of Bid Bond and attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the OWNER, in the amount of 5% of the bid. Such bid bond will be returned to the unsuccessful bidder(s) only upon written request to the Director of Procurement within seven (7) days of opening of bids. Bid bond shall be made payable to the Lexington-Fayette Urban County Government. Bid security is not required for projects under \$50,000.
- B. Bonds shall be placed with an agent licensed in Kentucky with surety authorized to do business within the state. When the premium is paid for such coverage, the full commission payable shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.

7. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the Contract and bonds required within ten (10) days after he has received notice of the acceptance of his bid, shall forfeit to the OWNER, as liquidated damages for such failure or refusal, the security deposited with his bid.

8. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" from the OWNER and to fully complete the Project within the time as specified in the Contract. Bidder must agree also to pay \$250.00 per calendar day thereafter deadline for substantial completion and \$250.00 per calendar day thereafter deadline for final completion.

9. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- A. It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site(s) to become familiar with local conditions that may affect cost, progress, performance or furnishing of the work, (c) consider Federal, State and Local laws and regulations that may affect cost, progress, performance or furnishing of the work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Owner of all conflicts, errors or discrepancies in the Contract Documents.
- B. Bidders should examine the requirements of Section 4 of the General Conditions for information pertaining to subsurface conditions, underground structures, underground facilities, and availability of lands, easements, and rights-of-way. The completeness of data, presented in the Contract Documents, pertaining to subsurface conditions, underground structures, and underground facilities for the

purposes of bidding or construction is not assured. The Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface and subsurface) which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents. On request in advance, OWNER will provide access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.

- C. The submission of a Bid will constitute an incontrovertible representation by the Bidder that Bidder has complied with every requirement of this paragraph; that without exception the Bid is premised upon furnishing and performing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents; and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

10. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the Contract Documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to the Director of Procurement, who in turn will have an addendum issued under signature of the Project Manager for the Lexington-Fayette Urban County Government, and to be given consideration must be received at least seven (7) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested, faxed or emailed to all prospective bidders. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

11. SECURITY FOR FAITHFUL PERFORMANCE

- A. Simultaneously with his delivery of the executed Contracts, the CONTRACTOR shall furnish a surety bond or bonds as security for the faithful performance of this Contract and for payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract, as specified in the General Conditions. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the OWNER and authorized to do business in the Commonwealth of Kentucky.

- B. All bonds required by this Contract and laws of this State shall be placed with agents licensed in the State of Kentucky. When the premium is paid for such coverages, the full commission shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.
- C. **Contractor shall use standard Performance and Payment Bond forms such as documents provided with this contract book or AIA form A312-1984 (or later).**

12. POWER OF ATTORNEY

Attorney-in-fact who signs bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

13. TAXES AND WORKMEN'S COMPENSATION

The CONTRACTOR and subcontractor will be required to accept liability for payment of all payroll taxes, sales and use tax, and all other taxes or deductions required by local, state or federal law. Each shall carry Workmen's Compensation Insurance to the full amounts as required by Statutes and shall include the cost of all foregoing items in the proposal. The CONTRACTOR will not otherwise be reimbursed or compensated for such tax payments. The CONTRACTOR is urged to ascertain at his own risk his actual tax liability in connection with the execution or performance of his Contract.

14. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the contract, the same as though herein written out in full.

15. EROSION AND SEDIMENT CONTROL AND PERMITS

The CONTRACTOR and Subcontractors performing work on projects on behalf of the OWNER shall also comply with all applicable federal, state, and local environmental regulations and all requirements and conditions set forth in "special" permits including but not limited to Corp of Engineers 404 permits, 401 Water Quality Certifications, Stream Crossing and Floodplain Encroachment Permits as described in Part 4 General Conditions Paragraph 5.17.

16. PREVAILING WAGE LAW AND MINIMUM HOURLY RATES

Federal wage rates and regulations, if required for this Project, will be as described in the Special Conditions.

17. AFFIRMATIVE ACTION PLAN

The successful Bidder must submit the entire proposal with their bid, the following items to the Urban County Government:

1. Certification of Bid Proposal/DBE – see Part III
2. KYTC DBE Provisions – see Part III
3. DBE Subcontractor Bidders List – see Part III

A Work Force Analysis Form shall be submitted for each Contract. Failure to submit any of these items as required herein may result in disqualification of the Bidder from award of the Contract.

18. CONTRACT TIME

The number of calendar days within which the Work is to be substantially completed and ready for final payment (the Contract Time) is set forth in the Contract Agreement.

19. SUBSTITUTE OR "APPROVED EQUAL" ITEMS

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "approved equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "approved equal" item of material or equipment may be furnished or used by the CONTRACTOR if acceptable to the OWNER, application for such acceptance will not be considered by the OWNER until after the effective date of the Agreement. The procedure for submission of any such application by the CONTRACTOR and consideration by the OWNER is set forth in the General Conditions.

20. ALTERNATE BIDS

Bidders shall submit alternate bids/proposals only if and when such alternate bids/proposals have been specifically requested in an Invitation for Bids. If alternate bids/proposals are requested in an Invitation for Bids, the form of submission of such alternate bid and the conditions under which such alternate bids will be considered for award of a contract will be established in the Invitation.

Any Bidder who submits a bid incorporating an alternate proposal when alternate bids/proposals have not been requested in the Invitation for Bids shall have his/her bid rejected as non-responsive.

Any Bidder who submits a bid incorporating two (2) or more prices for an item or groups of items (unless such method of pricing is requested in the Invitation for Bids), or which imposes conditions for acceptance other than those established in the Invitation for Bids, shall have their bid rejected as non-responsive.

21. SIGNING OF AGREEMENT

When OWNER gives a Notice of Award to the successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ten days thereafter, CONTRACTOR shall sign and deliver the required number of counterparts of the Agreement and attached documents to OWNER with the required Bonds, Certificate of Insurance, and Power of Attorney. The OWNER will deliver one fully signed counterpart to CONTRACTOR at such time as it has been signed by the Mayor.

22. ASSISTANCE TO BE OFFERED TO DISADVANTAGED BUSINESS ENTERPRISE (MWDBE) CONTRACTORS AND VETERAN OWNED SMALL BUSINESSES

A. Outreach for MWDBE(s) and Veteran Owned Small Businesses (VOSB)

The Lexington-Fayette Urban County Government (LFUCG) maintains a database of MWDBE contractors and Veteran Owned Small Businesses. When a LFUCG construction project is advertised for bidding, notices are sent to companies registered at <https://lexingtonky.ionwave.net>. The notices describe the project and indicate the deadline for submitting bids.

If you wish to be added to the LFUCG MWDBE contractor database, please contact:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
smiller@lexingtonky.gov

B. Bid Bond Assistance for MWDBE(s)

For those MWDBE contractors who wish to bid on LFUCG project, bid bond assistance is available. This bid bond assistance is in the form of a “Letter of Certification” which is accepted by the LFUCG’s Division of Purchasing, in lieu of a bid bond. The “Letter of Certification” must be included in the bid package when it is submitted to the Division of Purchasing. The “Letter of Certification” will reference the specific project for which the bid is being submitted, and the time and date on which the bid is due. Bid bond assistance must be requested from the Lexington-Fayette Urban County Government’s Division of Procurement.

C. Eligibility for Bid Bond Assistance for MWDBE(s)

In order to be eligible for any Bid bonding assistance, a MWDBE construction company must be owned or controlled at the level of 51% or more by a member or members of a minority group or females. Prior to receiving assistance, a statement providing evidence of ownership and control of the company by a member or members of a minority group or females must be signed by the Owner or corporate officer and by an attorney or accountant submitted to:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
smiller@lexingtonky.gov

D. MWDBE and Veteran Subcontractors

The LFUCG will, upon request, assist prime contractors in the procurement of eligible DBE subcontractors in an effort to achieve a 10% minimum MWDBE and a 3% minimum Veteran goal.

For a list of eligible subcontractors, please contact:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
smiller@lexingtonky.gov

23. LFUCG NON-APPROPRIATION CLAUSE

Contractor acknowledges that the LFUCG is a governmental entity, and the contract validity is based upon the availability of public funding under the authority of its statutory mandate.

In the event that public funds are unavailable and not appropriated for the performance of the LFUCG's obligations under this contract, then this contract shall automatically expire without penalty to the LFUCG thirty (30) days after written notice to Contractor of the unavailability and non-appropriation of public funds. It is expressly agreed that the LFUCG shall not activate this non-appropriation provision for its convenience or to circumvent the requirements of this contract, but only as an emergency fiscal measure during a substantial fiscal crisis, which affects generally its governmental operations.

In the event of a change in the LFUCG's statutory authority, mandate and mandated functions, by state and federal legislative or regulatory action, which adversely affects the LFUCG's authority to continue its obligations under this contract, then this contract shall automatically terminate without penalty to the LFUCG upon written notice to Contractor of such limitation or change in the LFUCG's legal authority.

END OF SECTION

PART III

FORM OF PROPOSAL

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PART III

Invitation to Bid No. 24-2024

Phoenix Park Reimagined Construction Project

1. FORM OF PROPOSAL

Place: Lexington, Kentucky

Date: _____

The following Form of Proposal shall be followed exactly in submitting a proposal for this Work.

This Proposal Submitted by _____

(Name and Address of Bidding Contractor)

(Hereinafter called "Bidder"), organized and existing under the laws of the State of _____, doing business as _____ "a corporation," "a partnership", or an "individual" as applicable.

To: Lexington-Fayette Urban County Government
(Hereinafter called "OWNER")
Office of the Director of Purchasing
200 East Main Street, 3rd Floor
Lexington, KY 40507

Gentlemen:

The Bidder, in compliance with your Invitation for Bids for the **Phoenix Park Reimagined Construction Project** having examined the Plans and Specifications with related documents, having examined the site for proposed Work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the Project in accordance with the Contract Documents, within the time set forth therein, and at the lump sum and/or unit prices stated hereinafter. These prices are to cover all expenses incurred in performing the Work required under the Contract Documents, of which this proposal is a part.

The Bidder hereby acknowledges receipt of the following addenda:

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Addendum No. _____ Date _____

Insert above the number and the date of any Addendum issued and received. If none has been issued and received, the word "NONE" should be inserted.

2. LEGAL STATUS OF BIDDER

Bidder _____

Date _____

* 1. A corporation duly organized and doing business under the laws of the State of _____, for whom _____, bearing the official title of _____, whose signature is affixed to this Bid/Proposal, is duly authorized to execute contracts.

* 2. A Partnership, all of the members of which, with addresses are: (Designate general partners as such)

* 3. An individual, whose signature is affixed to this Bid/Proposal (please print name)

*(The Bidder shall fill out the appropriate form and strike out the other two.)

3.

BIDDERS AFFIDAVIT

Comes the Affiant, _____, and after being first duly sworn, states under penalty of perjury as follows:

1. His/her name is _____ and he/she is the individual submitting the bid or is the authorized representative of _____, the entity submitting the bid (hereinafter referred to as "Bidder").

2. Bidder will pay all taxes and fees, which are owed to the Lexington-Fayette Urban County Government at the time the bid is submitted, prior to award of the contract and will maintain a "current" status in regard to those taxes and fees during the life of the contract.

3. Bidder will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the contract.

4. Bidder has authorized the Division of Procurement to verify the above-mentioned information with the Division of Revenue and to disclose to the Urban County Council that taxes and/or fees are delinquent or that a business license has not been obtained.

5. Bidder has not knowingly violated any provision of Chapter 25 of the Lexington-Fayette Urban County Government Code of Ordinances, known as the "Ethics Act."

6. Bidder acknowledges that "knowingly" for purposes of this Affidavit means, with respect to conduct or to circumstances described by a statute or ordinance defining an offense, that a person is aware or should have been aware that his conduct is of that nature or that the circumstance exists.

Signature

Printed Name

Title

Date

Company Name _____

Address _____

Subscribed and sworn to before me by _____
(Affiant)

(Title)

of _____ this _____ day of _____, 20____.
(Company Name)

Notary Public
[seal of notary]

My commission expires: _____

4. BID SCHEDULE – SCHEDULE OF VALUES

The Bidder agrees to perform all the Work described in the Specifications and shown on the Plans for the following proposed lump sum and/or unit prices, if applicable, which shall include the furnishing of all labor, materials, supplies, equipment and/or vehicle usage, services, all items of cost, overhead, taxes (federal, state, local), and profit for the Contractor and any Subcontractor involved, within the time set forth herein. If unit prices are applicable, Bidder must make the extensions and additions showing the total amount of bid.

Form of proposal must include unit bid prices written in words, unit price written in numbers and total amount bid (unit price x quantity) per line item OR bid may be considered non-responsive. In case of price discrepancy, unit bid price written in words will prevail followed by unit price written in numbers then total amount bid per line item.

If a discrepancy between the unit price and the item total exists, the unit price prevails except: If the unit price is illegible, omitted, or the same as the item total, item total prevails and the unit price is the quotient of the item total and the quantity.

If the unit price and the item total are illegible or are omitted, the bid may be determined nonresponsive. If a lump sum total price is illegible or is omitted, the bid may be determined nonresponsive.

For a unit price based bid, the sum of the item totals is the bid amount the Division uses for bid comparison.

The LFUCG's decision on the bid amount is final.

Pricing should be submitted in the Line Items tab on IonWave. Page P-7 must be fully executed and attached to bid submission or bid will be considered non-responsive.

BID ITEM NO.	UNIT DESCRIPTION	UNIT	QTY	COST
1	Phoenix Park Reimagined Construction Project, as per specs.	LS	1	XXXXXXXXXX
2	Allowance #1. Modular Restroom Building, as per specs.	LS	1	\$275,000.00

Submitted by:

Firm

Address

City, State & Zip

***Bid must be signed:
(original signature)***

Signature of Authorized Company Representative – Title

Representative/s Name (Typed or Printed)

Area Code – Phone – Fax #

E-Mail Address

OFFICIAL ADDRESS:

_____ (Seal if Bid is by Corporation)

By signing this form you agree to ALL terms, conditions, and associated forms in this bid package

5. STATEMENT OF BIDDER'S QUALIFICATIONS

The following statement of the Bidder's qualifications is required to be filled in, executed, and submitted with the Proposal:

1. Name of Bidder: _____

2. Permanent Place of Business: _____

3. When Organized: _____

4. Where Incorporated: _____

5. Construction Plant and Equipment Available for this Project:

(Attach Separate Sheet If Necessary)

6. Financial Condition:

If specifically requested by the OWNER, the apparent low Bidder is required to submit its latest three (3) years audited financial statements to the OWNER'S Division of Procurement within seven (7) calendar days following the bid opening.

7. In the event the Contract is awarded to the undersigned, surety bonds will be furnished by:

(Surety)

Signed: _____ (Representative of Surety)

8. The following is a list of similar projects performed by the Bidder: (Attach separate sheet if necessary).

<u>NAME</u>	<u>LOCATION</u>	<u>CONTRACT SUM</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

9. The Bidder has now under contract and bonded the following projects:

<u>NAME</u>	<u>LOCATION</u>	<u>CONTRACT SUM</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

10. List Key Bidder Personnel who will work on this Project.

<u>NAME</u>	<u>POSITION DESCRIPTION</u>	<u>NO. OF YEARS WITH BIDDER</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

11. DBE Participation on current bonded projects under contract:

<u>SUBCONTRACTORS</u> <u>(LIST)</u>	<u>PROJECT</u> <u>(SPECIFIC TYPE)</u>	<u>DBE</u>	<u>% of WORK</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(USE ADDITIONAL SHEETS IF NECESSARY)

12. We acknowledge that, if we are the apparent low Bidder, we will submit to the OWNER within 7 calendar days following the Bid Opening, a sworn statement on the OWNER'S form regarding all current work on hand and under contract, and a statement on the OWNER'S form of the experience of our officers, office management and field management personnel. Additionally, if requested by the OWNER, we will within 7 days following the request submit audited financial statements and loss history for insurance claims for the 3 most recent years (or a lesser period stipulated by the OWNER)—all in accordance with the Bid Documents.

Respectfully submitted:

(Name of Contracting Firm)

BY: _____

TITLE: _____

DATE _____

6. LIST OF PROPOSED SUBCONTRACTORS

The following list of proposed subcontractors is required by the OWNER to be executed, completed and submitted with the BIDDER'S FORM OF PROPOSAL. All subcontractors are subject to approval of the Lexington-Fayette Urban County Government. Failure to submit this list completely filled out may be cause for rejection of bid.

<u>BRANCH OF WORK-LIST</u>	<u>DBE</u> Work	% of <u>EACH MAJOR ITEM</u>
-----------------------------------	----------------------------------	------------------------------------

LIST OF MATERIALS/ SUPPLIERS

Bidders are hereby advised that this list must be complete and submitted with the Bid. Cut sheets for all mechanical system must be included with bid submittal.

Listing "as per plans and specifications", will not be considered as sufficient identification. Where more than one "Make or Brand" is listed for any one item, the Owner has the right to select the one to be used.

Item	Brand Name, Manufacturer and Supplier
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**7. Lexington-Fayette Urban County Government
MWDBE PARTICIPATION GOALS**

A. GENERAL

- 1) The LFUCG request all potential contractors to make a concerted effort to include Minority-Owned (MBE), Woman-Owned (WBE), Disadvantaged (DBE) Business Enterprises and Veteran-Owned Small Businesses (VOSB) as subcontractors or suppliers in their bids.
- 2) Toward that end, the LFUCG has established 10% of total procurement costs as a Goal for participation of Minority-Owned, Woman-Owned and Disadvantaged Businesses on this contract.
- 3) **It is therefore a request of each Bidder to include in its bid, the same goal (10%) for MWDBE participation and other requirements as outlined in this section.**
- 4) The LFUCG has also established a 3% of total procurement costs as a Goal for participation for of Veteran-Owned Businesses.
- 5) **It is therefore a request of each Bidder to include in its bid, the same goal (3%) for Veteran-Owned participation and other requirements as outlined in this section.**

B. PROCEDURES

- 1) The successful bidder will be required to report to the LFUCG, the dollar amounts of all payments submitted to Minority-Owned, Woman-Owned or Veteran-Owned subcontractors and suppliers for work done or materials purchased for this contract. (See Subcontractor Monthly Payment Report)
- 2) Replacement of a Minority-Owned, Woman-Owned or Veteran-Owned subcontractor or supplier listed in the original submittal must be requested in writing and must be accompanied by documentation of Good Faith Efforts to replace the subcontractor / supplier with another MWDBE Firm; this is subject to approval by the LFUCG. (See LFUCG MWDBE Substitution Form)
- 3) For assistance in identifying qualified, certified businesses to solicit for potential contracting opportunities, bidders may contact:
 - a) The Lexington-Fayette Urban County Government, Division of Procurement (859-258-3320)
- 4) The LFUCG will make every effort to notify interested MWDBE and Veteran-Owned subcontractors and suppliers of each Bid Package, including information on the scope of work, the pre-bid meeting time and location, the bid date, and all other pertinent information regarding the project.

C. DEFINITIONS

- 1) A Minority-Owned Business Enterprise (MBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by persons of African American, Hispanic, Asian, Pacific Islander, American Indian or Alaskan Native Heritage.
- 2) A Woman-Owned Business Enterprise (WBE) is defined as a business which is certified as

being at least 51% owned, managed and controlled by one or more women.

- 3) A Disadvantaged Business (DBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by a person(s) that are economically and socially disadvantaged.
- 4) A Veteran-Owned Small Business (VOSB) is defined as a business which is certified as being at least 51% owned, managed and controlled by a veteran and/or a service disabled veteran.
- 5) Good Faith Efforts are efforts that, given all relevant circumstances, a bidder or proposer actively and aggressively seeking to meet the goals, can reasonably be expected to make. In evaluating good faith efforts made toward achieving the goals, whether the bidder or proposer has performed the efforts outlined in the Obligations of Bidder for Good Faith Efforts outlined in this document will be considered, along with any other relevant factors.

D. OBLIGATION OF BIDDER FOR GOOD FAITH EFFORTS

- 1) **The bidder shall make a Good Faith Effort to achieve the Participation Goal for MWDBE and Veteran-Owned subcontractors/suppliers. The failure to meet the goal shall not necessarily be cause for disqualification of the bidder; however, bidders not meeting the goal are required to furnish with their bids written documentation of their Good Faith Efforts to do so.**
- 2) Award of Contract shall be conditioned upon satisfaction of the requirements set forth herein.
- 3) The Form of Proposal includes a section entitled "MWDBE Participation Form". The applicable information must be completed and submitted as outlined below.
- 4) **Failure to submit this information as requested may be cause for rejection of bid or delay in contract award.**

E. DOCUMENTATION REQUIRED FOR GOOD FAITH EFFORTS

- 1) Bidders reaching the Goal are required to submit only the MWDBE Participation Form." The form must be fully completed including names and telephone number of participating MWDBE firm(s); type of work to be performed; estimated value of the contract and value expressed as a percentage of the total Lump Sum Bid Price. The form must be signed and dated, and is to be submitted with the bid.
- 2) Bidders not reaching the Goal must submit the "MWDBE Participation Form", the "Quote Summary Form" and a written statement documenting their Good Faith Effort to do so. If bid includes no MWDBE and/or Veteran participation, bidder shall enter "None" on the subcontractor / supplier form). In addition, the bidder must submit written proof of their Good Faith Efforts to meet the Participation Goal:
 - a. Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission

of bids to allow MWDBE firms and Veteran-Owned businesses to participate.

b. Included documentation of advertising in the above publications with the bidders good faith efforts package

c. Attended LFUCG Procurement Economic Inclusion Outreach event

d. Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned businesses of subcontracting opportunities

e. Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses.

f. Requested a list of MWDBE and/or Veteran subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

g. Contacted organizations that work with MWDBE companies for assistance in finding certified MWDBE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

h. Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs and/or Veteran-Owned businesses soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

i. Followed up initial solicitations by contacting MWDBEs and Veteran-Owned Businesses to determine their level of interest.

j. Provided the interested MWDBE firm and/or Veteran-Owned business with adequate and timely information about the plans, specifications, and requirements of the contract.

k. Selected portions of the work to be performed by MWDBE firms and/or Veteran-Owned businesses in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE and Veteran participation, even when the prime contractor may otherwise perform these work items with its own workforce

l. Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

m. Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

n. Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

o. Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

p. Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

q. Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE and Veteran participation.

Note: Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to review by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.



MINORITY BUSINESS ENTERPRISE PROGRAM

Sherita Miller, MPA
Minority Business Enterprise Liaison
Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, KY 40507
smiller@lexingtonky.gov
859-258-3323

OUR MISSION: The mission of the Minority Business Enterprise Program is to facilitate the full participation of minority and women owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long term economic viability of Lexington-Fayette Urban County Government.

To that end the city council adopted and implemented Resolution 484-2017 – A Certified Minority, Women and Disadvantaged Business Enterprise ten percent (10%) minimum goal and a three (3%) minimum goal for Certified Veteran-Owned Small Businesses and Certified Service Disabled Veteran – Owned Businesses for government contracts.

The resolution states the following definitions shall be used for the purposes of reaching these goals (a full copy is available in Procurement):

Certified Disadvantaged Business Enterprise (DBE) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a person(s) who is socially and economically disadvantaged as define by 49 CFR subpart 26.

Certified Minority Business Enterprise (MBE) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by an ethnic minority (i.e. African American, Asian American/Pacific Islander, Hispanic Islander, Native American/Native Alaskan Indian) as defined in federal law or regulation as it may be amended from time-to-time.

Certified Women Business Enterprise (WBE) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a woman.

Certified Veteran-Owned Small Business (VOSB) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.

Certified Service Disabled Veteran Owned Small Business (SDVOSB) – a business in which at least fifty-one percent (51%) is owned, managed and controlled by a disabled veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.

The term “Certified” shall mean the business is appropriately certified, licensed, verified, or validated by an organization or entity recognized by the Division of Purchasing as having the appropriate credentials to make a determination as to the status of the business.

To comply with Resolution 484-2017, prime contractors and minority, women and veteran owned businesses must

enroll in the new Diverse Business Management Compliance system, <https://lexingtonky.diversitycompliance.com/>

We have compiled the list below to help you locate certified MBE, WBE and DBE certified businesses. Below is a listing of contacts for LFUCG Certified MWDBEs and Veteran-Owned Small Businesses in <https://lexingtonky.ionwave.net>

Business	Contact	Email Address	Phone
LFUCG	Sherita Miller	smiller@lexingtonky.gov	859-258-3323
Commerce Lexington – Minority Business Development	Tyrone Tyra	ttyra@commercelexington.com	859-226-1625
Tri-State Minority Supplier Diversity Council	Susan Marston	smarston@tsmsdc.com	502-365-9762
Small Business Development Council	Shawn Rogers UK SBDC	shawn.rogers@uky.edu	859-257-7666
Community Ventures Corporation	Phyllis Alcorn	palcorn@cvky.org	859-231-0054
KY Transportation Cabinet (KYTC)	Melvin Bynes	Melvin.bynes2@ky.gov	502-564-3601
KYTC Pre-Qualification	Shella Eagle	Shella.Eagle@ky.gov	502-782-4815
Ohio River Valley Women’s Business Council (WBENC)	Sheila Mixon	smixon@orvwbc.org	513-487-6537
Kentucky MWBE Certification Program	Yvette Smith, Kentucky Finance Cabinet	Yvette.Smith@ky.gov	502-564-8099
National Women Business Owner’s Council (NWBOC)	Janet Harris-Lange	janet@nwbo.org	800-675-5066
Small Business Administration	Robert Coffey	robertcoffey@sba.gov	502-582-5971
LaVoz de Kentucky	Andres Cruz	lavozdeky@yahoo.com	859-621-2106
The Key News Journal	Patrice Muhammad	production@keynewsjournal.com	859-685-8488



LFUCG MWDBE PARTICIPATION FORM

Bid/RFP/Quote Reference # _____

The MWDBE and/or veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to Procurement for approval immediately. **Failure to submit a completed form may cause rejection of the bid.**

MWDBE Company, Name, Address, Phone, Email	MBE WBE or DBE	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1.				
2.				
3.				
4.				

The undersigned company representative submits the above list of MWDBE firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Company

Company Representative

Date

Title



LFUCG MWDBE SUBSTITUTION FORM
Bid/RFP/Quote Reference # _____

The substituted MWDBE and/or veteran subcontractors listed below have agreed to participate on this Bid/RFP/Quote. These substitutions were made prior to or after the job was in progress. These substitutions were made for reasons stated below and are now being submitted to Procurement for approval. By the authorized signature of a representative of our company, we understand that this information will be entered into our file for this project.

SUBSTITUTED MWDBE Company Name, Address, Phone, Email	MWDBE Formally Contracted/ Name, Address, Phone, Email	Work to Be Performed	Reason for the Substitution	Total Dollar Value of the Work	% Value of Total Contract
1.					
2.					
3.					
4.					

The undersigned acknowledges that any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Company

Company Representative

Date

Title



MWDBE QUOTE SUMMARY FORM

Bid/RFP/Quote Reference # _____

The undersigned acknowledges that the minority and/or veteran subcontractors listed on this form did submit a quote to participate on this project. Failure to submit this form may cause rejection of the bid.

Company Name	Contact Person
Address/Phone/Email	Bid Package / Bid Date

MWDBE Company Address	Contact Person	Contact Information (work phone, Email, cell)	Date Contacted	Services to be performed	Method of Communication (email, phone meeting, ad, event etc)	Total dollars \$\$ Do Not Leave Blank (Attach Documentation)	MBE * AA HA AS NA Female	Veteran

(MBE designation / AA=African American / HA= Hispanic American/AS = Asian American/Pacific Islander/ NA= Native American)

The undersigned acknowledges that all information is accurate. Any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Company

Company Representative

Date

Title



LFUCG SUBCONTRACTOR MONTHLY PAYMENT REPORT

The LFUCG has a 10% goal plan adopted by city council to increase the participation of minority and women owned businesses in the procurement process. The LFUCG also has a 3% goal plan adopted by cited council to increase the participation of veteran owned businesses in the procurement process. In order to measure that goal LFUCG will track spending with MWDBE and Veteran contractors on a monthly basis. By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentation may result in termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims. Please submit this form monthly to the Division of Procurement/ 200 East Main Street / Room 338 / Lexington, KY 40507.

Bid/RFP/Quote # _____

Total Contract Amount Awarded to Prime Contractor for this Project _____

Project Name/ Contract #	Work Period/ From: _____ To: _____
Company Name:	Address:
Federal Tax ID:	Contact Person:

Subcontractor Vendor ID (name, address, phone, email)	Description of Work	Total Subcontract Amount	% of Total Contract Awarded to Prime for this Project	Total Amount Paid for this Period	Purchase Order number for subcontractor work (please attach PO)	Scheduled Project Start Date	Scheduled Project End Date

By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

Company

Company Representative

Date

Title

LFUCG STATEMENT OF GOOD FAITH EFFORTS

Bid/RFP/Quote # _____

By the signature below of an authorized company representative, we certify that we have utilized the following Good Faith Efforts to obtain the maximum participation by MWDBE and Veteran-Owned business enterprises on the project and can supply the appropriate documentation.

_____ Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow MWDBE firms and Veteran-Owned businesses to participate.

_____ Included documentation of advertising in the above publications with the bidders good faith efforts package

_____ Attended LFUCG Procurement Economic Inclusion Outreach event

_____ Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned Businesses of subcontracting opportunities

_____ Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses

_____ Requested a list of MWDBE and/or Veteran subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

_____ Contacted organizations that work with MWDBE companies for assistance in finding certified MWDBE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

_____ Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

_____ Followed up initial solicitations by contacting MWDBEs and Veteran-Owned businesses to determine their level of interest.

_____ Provided the interested MWDBE firm and/or Veteran-Owned business with adequate and timely information about the plans, specifications, and requirements of the contract.

_____ Selected portions of the work to be performed by MWDBE firms and/or Veteran-Owned businesses in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE and Veteran participation,

even when the prime contractor may otherwise perform these work items with its own workforce

_____ Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

_____ Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

_____ Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

_____ Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

_____ Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

_____ Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE and Veteran participation.

NOTE: Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to approval by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.

The undersigned acknowledges that all information is accurate. Any misrepresentations may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Company

Company Representative

Date

Title

8. **AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION, NON-CONFLICT OF INTEREST**

I hereby swear (or affirm) under the penalty for false swearing:

1. That I am the Bidder (if the Bidder is an individual), a partner of the Bidder (if the Bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the Bidder is a corporation);
2. That the attached bid has been arrived at by the Bidder independently, and has been submitted without collusion with, and without any agreement, understanding or planned common course of action, with any other contractor, vendor of materials, supplies, equipment or services described in the Invitation to Bid, designed to limit independent bidding or competition;
3. That the contents of the bid or bids have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder or its surety on any bond furnished, with the bid or bids, and will not be communicated to any such person, prior to the official opening of the bid or bids;
4. That the Bidder is legally entitled to enter into the contracts with the Lexington-Fayette Urban County Government, and is not in violation of any prohibited conflict of interest;
5. (Applicable to corporation only) That as a foreign corporation, we are registered with the Secretary of State, Commonwealth of Kentucky, and authorized to do business in the State _____ or, that as a domestic corporation, we are in good standing with the Secretary of State, Commonwealth of Kentucky _____. Check the statement applicable.
6. This offer is for 60 calendar days from the date this bid is opened. In submitting the above, it is expressly agreed that, upon proper acceptance by the Lexington-Fayette Urban County Government of any or all items bid above, a contract shall thereby be created with respect to the items accepted.
7. That I have fully informed myself regarding the accuracy of the statements made in this statement.
8. That I certify that Subcontractors have not and will not be awarded to any firm(s) that have been debarred from noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

9. STATEMENT OF EXPERIENCE

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

*** Include all officers, office management's, Affirmative Action officials, and field management personnel. (Attach separate sheets if necessary.)**

10. EQUAL OPPORTUNITY AGREEMENT

Standard Title VI Assurance

The Lexington Fayette-Urban County Government, (hereinafter referred to as the “Recipient”) hereby agrees that as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation, it will comply with Title VI of the Civil Rights Act of 1964, 78Stat.252, 42 U.S.C. 2000d-4 (hereinafter referred to as the “Act”), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, (49 CFR, Part 21) Nondiscrimination in Federally Assisted Program of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964 (hereinafter referred to as the “Regulations”) and other pertinent directives, no person in the United States shall, on the grounds of race, color, national origin, sex, age (over 40), religion, sexual orientation, gender identity, veteran status, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Recipient receives Federal financial assistance from the U.S. Department of Transportation, including the Federal Highway Administration, and hereby gives assurance that will promptly take any necessary measures to effectuate this agreement. This assurance is required by subsection 21.7(a) (1) of the Regulations.

The Law

- * Title VII of the Civil Rights Act of 1964 (amended 1972) states that it is unlawful for an employer to discriminate in employment because of race, color, religion, sex, age (40-70 years) or national origin.
- * Executive Order No. 11246 on Nondiscrimination under Federal contract prohibits employment discrimination by contractor and subcontractor doing business with the Federal Government or recipients of Federal funds. This order was later amended by Executive Order No. 11375 to prohibit discrimination on the basis of sex.
- * Section 503 of the Rehabilitation Act of 1973 States:
The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap.
- * Section 2012 of the Vietnam Era Veterans Readjustment Act of 1973 requires Affirmative Action on behalf of disabled veterans and veterans of the Vietnam Era by contractors having Federal Contracts.
- * Section 206 (A) of Executive Order 12086, Consolidation of Contract Compliance Functions for Equal Employment Opportunity, states:
The Secretary of Labor may investigate the employment practices of any Government contractor or sub-contractor to determine whether or not the contractual provisions specified in Section 202 of this order have been violated.

The Lexington-Fayette Urban County Government practices Equal Opportunity in recruiting, hiring and promoting. It is the Government's intent to affirmatively provide employment opportunities for those individuals who have previously not been allowed to enter into the mainstream of society. Because of its importance to the local Government, this policy carries the full endorsement of the Mayor, Commissioners, Directors, and all supervisory personnel. In

following this commitment to Equal Employment Opportunity and because the Government is the benefactor of the Federal funds, it is both against the Urban County Government policy and illegal for the Government to let contracts to companies which knowingly or unknowingly practice discrimination in their employment practices. Violation of the above mentioned ordinances may cause a contract to be canceled and the contractor may be declared ineligible for future consideration.

Please sign this statement in the appropriate space acknowledging that you have read and understand the provisions contained herein. Return this document as part of your application packet.

Bidders

I/We agree to comply with the Civil Rights Laws listed above that govern employment rights of minorities, women, Vietnam veterans, handicapped, and aged persons.

Signature

Name of Business

The Entity (regardless of whether construction contractor, non-construction contractor or supplier) agrees to provide equal opportunity in employment for all qualified persons, to prohibit discrimination in employment because of race, color, religion, sex (including pregnancy, sexual orientation or gender identity), national origin, disability, age, genetic information, political affiliation, or veteran status, and to promote equal employment through a positive, continuing program from itself and each of its sub-contracting agents. This program of equal employment opportunity shall apply to every aspect of its employment policies and practices.

The Kentucky equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) requires that any count, city, town, school district, water district, hospital district, or other political subdivision of the state shall include in directly or indirectly publicly funded contracts for supplies, materials, services, or equipment hereinafter entered into the following provisions:

During the performance of this contract, the contractor agrees as follows:

- (1) *The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age or national origin;*
- (2) *The contractor will state in all solicitations or advertisements for employees placed by or on behalf of the contractors that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age or national origin;*
- (3) *The contract will post notices in conspicuous places, available to employees and applicants for employment, setting forth the provisions of the non-discrimination clauses required by this section; and*
- (4) *The contractor will send a notice to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding advising the*

labor union or workers' representative of the contractor's commitments under the nondiscrimination clauses.

The Act further provides:

KRS 45.610. Hiring minorities – Information required

- (1) *For the length of the contract, each contractor shall hire minorities from other sources within the drawing area, should the union with which he has collective bargaining agreements be unwilling to supply sufficient minorities to satisfy the agreed upon goals and timetable.*
- (2) *Each contractor shall, for the length of the contract, furnish such information as required by KRS 45.560 to KRS 45.640 and by such rules, regulations and orders issued pursuant thereto and will permit access to all books and records pertaining to his employment practices and work sites by the contracting agency and the department for purposes of investigation to ascertain compliance with KRS 45.560 to 45.640 and such rules, regulations and orders issued pursuant thereto.*

KRS 45.620. Action against contractor – Hiring of minority contractor or subcontractor

- (1) *If any contractor is found by the department to have engaged in an unlawful practice under this chapter during the course of performing under a contract or subcontract covered under KRS 45.560 to 45.640, the department shall so certify to the contracting agency and such certification shall be binding upon the contracting agency unless it is reversed in the course of judicial review.*
- (2) *If the contractor is found to have committed an unlawful practice under KRS 45.560 to 45.640, the contracting agency may cancel or terminate the contract, conditioned upon a program for future compliance approved by the contracting agency and the department. The contracting agency may declare such a contractor ineligible to bid on further contracts with that agency until such time as the contractor complies in full with the requirements of KRS 45.560 – 45.640.*
- (3) *The equal employment provisions of KRS 45.560 to 45.640 may be met in part by a contractor by subcontracting to a minority contractor or subcontractor. For the provisions of KRS 45.560 to 45.640, a minority contractor or subcontractor shall mean a business that is owned and controlled by one or more persons disadvantaged by racial or ethnic circumstances.*

KRS 45.630 Termination of existing employee not required, when

Any provision of KRS 45.560 to 45.640 notwithstanding, no contractor shall be required to terminate an existing employee upon proof that that employee was employed prior to the date of the contract.

KRS 45.640 Minimum skills

Nothing in KRS 45.560 to 45.640 shall require a contractor to hire anyone who fails to demonstrate the minimum skills required to perform a particular job.

It is recommended that all of the provisions quoted above to be included as special conditions in each contract. In the case of a contract exceeding \$250,000, the contractor is required to furnish evidence that his work-force in Kentucky is representative of the available work-force in the area from which he draws employees, or to supply an Affirmative Action plan which will achieve such representation during the life of the contract.

11. **EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION POLICY**

It is the policy of _____
to assure that all applicants for employment and all employees are treated on a fair and equitable basis without regard to their race, religion, sex, color, handicap, natural origin or age.

Such action shall include employment, promotion, demotion, recruitment or recruitment advertising, layoff or termination, rates of pay and other forms of compensation, and selection for training, whether apprenticeship and/or on-the-job-training.

Furthermore, this company agrees to make special recruitment efforts to hire the protected class whenever feasible. This company also agrees to adhere to all applicable federal, state, and local laws relating to Equal Employment Opportunity for all individuals.

12. WORKFORCE ANALYSIS FORM

Name of Organization: _____

Categories	Total	White (Not Hispanic or Latino)		Hispanic or Latino		Black or African- American (Not Hispanic or Latino)		Native Hawaiian and Other Pacific Islander (Not Hispanic or Latino)		Asian (Not Hispanic or Latino)		American Indian or Alaskan Native (not Hispanic or Latino)		Two or more races (Not Hispanic or Latino)		Total		
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Administrators																		
Professionals																		
Superintendents																		
Supervisors																		
Foremen																		
Technicians																		
Protective Service																		
Para-Professionals																		
Office/Clerical																		
Skilled Craft																		
Service/Maintenance																		
Total:																		

Prepared by: _____
(Name and Title)

Date: ____/____/____
Revised 2015-Dec-15

13. EVIDENCE OF INSURABILITY

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT CONSTRUCTION PROJECT
(Use separate form for each Agency or Brokerage agreeing to provide coverage)

Names Insured: _____ Employee ID: _____

Address: _____ Phone: _____

Project to be insured: _____

In lieu of obtaining certificates of insurance at this time, the undersigned agrees to provide the above Named Insured with the minimum coverage listed below. These are outlined in the Insurance and Risk Management of Part V (Special Conditions), including all requirements, and conditions:

Section Items	Coverage	Minimum Limits and Policy Requirements	Limits Provided To Insured	Name of Insurer	A.M. Best's Code	Rating
SC-2 – see provisions	CGL	\$1,000,000 per occ. And \$2,000,000 aggregate	\$			
SC-2 – see provisions	AUTO	\$1,000,000/per occ.	\$			
SC-2 – see provisions	WC	Statutory w/endorsement as noted	\$			
SC-2 – see provisions	EXC	\$5,000,000 per occ.	\$			

Section 2 includes required provisions, statements regarding insurance requirements, and the undersigned agrees to abide by all provisions for the coverage's checked above unless stated otherwise when submitting.

Agency or Brokerage _____ Name of Authorized Representative _____

Street Address _____ Title _____

City _____ State _____ Zip _____ Authorized Signature _____

Telephone Number _____ Date _____

NOTE: Authorized signatures may be the agent's if agent has placed insurance through an agency agreement with the insurer. If insurance is brokered, authorized signature must be that of authorized representative of insurer.

IMPORTANT: Contract may not be awarded if a completed and signed copy of this form for all coverage's listed above is not provided with the bid.

14. DEBARRED FIRMS

PROJECT NAME: _____

BID NUMBER: _____

**LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
LEXINGTON, KY**

All prime Contractors shall certify that Subcontractors have not and will not be awarded to any firms that has been debarred for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

All bidders shall complete the attached certification in duplicate and submit both copies to the Owner with the bid proposal. The Owner (grantee) shall transmit one copy to the Lexington-Fayette Urban County Government, Division of Community Development, within fourteen (14) days after bid opening.

The undersigned hereby certifies that the firm of _____ has not and will not award a subcontract, in connection with any contract award to it as the result of this bid, to any firm that has been debarred for noncompliance with the Federal labor Standards, Title VI of the civil Rights Act of 1964, Executive Order 11246 as amended or any Federal Law.

Name of Firm Submitting Bid

Signature of Authorized Official

Title

Date

15. DEBARMENT CERTIFICATION

All contractors/subcontractors shall complete the following certification and submit it with the bid proposal.

The contractor/subcontractor certifies in accordance with Executive Order 12549 (Debarment and Suspension 2/18/86) that to the best of its knowledge and belief, that it and its principals:

- 1) Are not presently debarred, suspended, proposed for debarment, declared negligible, or voluntarily excluded from covered transactions or contract by any Federal department or agency for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 as amended, Executive Order 11246 as amended or any other Federal law;
 - a) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - b) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(a) of this certification; and
 - c) Have not within a three year period preceding this bid has one or more public (Federal, State or local) transactions or contracts terminated for cause or default.
- 2) Where the contractor is unable to certify to any of the statements in this certification, such prospective contractors shall attach an explanation to this certification form.

Firm Name: _____

Project: _____

Printed Name and Title of Authorized Representative: _____

Signature: _____

Date: _____

END OF SECTION

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GENERAL CONDITIONS
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 - 10.6 CONTRACTOR'S Fee
 - 10.7 Itemized Cost Breakdown
 - 10.8 Cash Allowance
 - 10.9 Unit Price Work

- 11. Change of Contract Time
 - 11.1 Change Order
 - 11.2 Justification for Time Extension
 - 11.3 Time Limits

- 12. Warranty and Guarantee; Tests and Inspections; Correction, Removal or Acceptance of Defective Work
 - 12.1 Warranty and Guarantee
 - 12.2 Access to Work
 - 12.3 Tests and Inspections
 - 12.4 OWNER May Stop Work
 - 12.5 Correction or Removal of Defective Work
 - 12.6 One Year Correction Period
 - 12.7 Acceptance of Defective work
 - 12.8 Owner May Correct Defective Work

- 13. Payments to CONTRACTOR and Completion
 - 13.1 Schedule of Values
 - 13.2 Application for Progress Payments
 - 13.3 CONTRACTOR'S Warranty of Title
 - 13.4 Review of Application for Progress Payments
 - 13.5 Partial Utilization
 - 13.6 Final Inspection
 - 13.7 Final Application for Payment
 - 13.8 Final Payment and Acceptance
 - 13.9 CONTRACTOR'S Continuing Obligation
 - 13.10 Waiver of Claims

14. Suspension of Work and Termination

- 14.1 OWNER May Suspend Work
- 14.2 OWNER May Terminate
- 14.3 CONTRACTOR'S Services Terminated
- 14.4 Payment After Termination
- 14.5 CONTRACTOR May Stop or Terminate

15. Miscellaneous

- 15.1 Claims for Injury or Damage
- 15.2 Non-Discrimination in Employment
- 15.3 Temporary Street Closing or Blockage
- 15.4 Percentage of Work Performed by Prime CONTRACTOR
- 15.5 Clean-up
- 15.6 General
- 15.7 Debris Disposal

END OF SECTION

PART IV

GENERAL CONDITIONS

1. DEFINITIONS

Wherever used in these General Conditions or the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof.

1.1 **Addenda**

Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bid Documents or the Contract Documents.

1.2 **Agreement**

The written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

1.3 **Application for Payment**

The form accepted by CONSULTANT which is to be used by CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

1.4 **Bid**

The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

1.5 **Bidder**

An individual, partnership, or corporation, who submit a Bid for a prime contract with the OWNER, for the Work described in the proposed Contract Documents.

1.6 **Bonds**

Bid, performance and payment bonds and other instruments of security.

1.7 **Calendar Day**

A calendar day of twenty-four hours measured from midnight to the next midnight shall constitute a day.

1.8 **Change Order**

A document recommended by CONSULTANT, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

1.9 Contract Documents

The Advertisement for Bidders, Information for Bidders, Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S Bid (including documentation accompanying the Bid and any post-bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Special Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements.

1.10 Contract Unit Price

The monies payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement. Unit Prices are to be firm for the term of this Contract.

1.11 Contract Time

The number of consecutive calendar days between the date of issuance of the Notice to Proceed and the contract completion date.

1.12 CONTRACTOR

The person, firm or corporation with whom OWNER has entered into the Agreement.

1.13 Defective

An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to CONSULTANT'S recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER).

1.14 Drawings

The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by CONSULTANT and are referred to in the Contract Documents.

1.15 Effective Date of the Agreement

The date indicated in the Agreement on which it becomes effective.

1.16 CONSULTANT

The Lexington-Fayette Urban County Government or its authorized representative.

1.17 Field Order

A documented order issued by CONSULTANT which orders minor changes in the Work, but which does not involve a change in the Contract Price or the Contract Time.

- 1.18 Giving Notice**
Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.
- 1.19 Laws and Regulations**
Laws, rules, regulations, ordinances, codes and/or orders.
- 1.20 Notice of Award**
The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.
- 1.21 Notice to Proceed**
A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR'S obligations under the Contract Documents.
- 1.22 OWNER**
The Lexington-Fayette Urban County Government.
- 1.23 Partial Utilization**
Placing a portion of the Work in service for the purpose for which it is intended (or related purpose) before reaching Completion for all the Work.
- 1.24 Project**
The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.
- 1.25 Inspector**
The authorized representative who is assigned to the site or any part thereof.
- 1.26 Shop Drawings**
All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.
- 1.27 Specifications**
Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and

workmanship as applied to the Work and certain administrative details applicable thereto.

1.28 Standard Specifications

The "Standard Specifications for Road and Bridge Construction", Transportation Cabinet, Department of Highways, Commonwealth of Kentucky, current edition. MUTCD shall refer to the "Manual of Uniform Traffic Control Devices.

1.29 Subcontractor

An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

1.30 Special Conditions

The part of the Contract Documents which amends or supplements these General Conditions.

1.31 Supplier

A manufacturer, fabricator, supplier, distributor, materialman or vendor.

1.32 Underground Facilities

All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

1.33 Unit Price Work

An amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

1.34 Work

The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

1.35 Time Period

When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

2. PRELIMINARY MATTERS

2.1 Delivery of Bonds

When the CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER, such Bonds, Insurance Certificate, and Power of Attorney as CONTRACTOR may be required to furnish.

2.2 Commencement of Contract Time; Notice to Proceed

The Contract Time will commence to run on the day specified in the Notice to Proceed.

2.3 Starting the Project

CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

2.4 Before Starting Construction

Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to CONSULTANT any conflict, error or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from CONSULTANT before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or CONSULTANT for failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

2.5 Submittal of Schedules

Within ten days after the effective date of the Agreement (unless otherwise specified) CONTRACTOR shall submit to CONSULTANT for review:

2.5.1 an estimated progress schedule indicating the starting and completion dates of the various stages of the Work;

2.5.2 a preliminary schedule of Shop Drawing submissions; and

2.5.3 a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into costs per labor and materials by specification section to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by CONTRACTOR at the time of submission. Schedule of values shall be submitted on AIA G702/703 forms, or approved equal.

2.6 Preconstruction Conference

Before CONTRACTOR starts the Work at the proposed site, a conference attended by CONTRACTOR, CONSULTANT, EEO-Affirmative Action Officer, and other appropriate parties will be held to discuss the following issues: (1) The scheduling of the Work to be completed; (2) The procedures for handling shop drawings and other submittals; (3) The processing of applications for payment; (4) The establishment of an understanding among the involved parties in regard to the proposed project; (5) The establishment of procedures for effectively implementing the LFUCG's 10% minimum DBE goals; and (6) Requirement for Mechanic's Lien on Partial Applications for Payment.

2.7 Finalizing Schedules

At least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, CONSULTANT and others as appropriate will be held to finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to CONSULTANT as providing orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on CONSULTANT responsibility for the progress or scheduling of the Work nor relieve CONTRACTOR from full responsibility thereof. The finalized schedule of Shop Drawing submissions will be acceptable to CONSULTANT as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to CONSULTANT as to form and substance.

3. CONTRACT DOCUMENTS: INTENT, CONFLICTS, AMENDING AND REUSE

3.1 General

The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2 Intent

It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no

Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or CONSULTANT, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to CONSULTANT, or any of CONSULTANT'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4. Clarifications and interpretations of the Contract Documents shall be issued by CONSULTANT as provided in paragraph 8.4.

3.3 Conflicts

If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to CONSULTANT in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from CONSULTANT; however, CONTRACTOR shall not be liable to OWNER or CONSULTANT for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order:

1. Agreement
2. Field and Change Orders
3. Addenda
4. Special Conditions
5. Instruction to Bidders
6. General Conditions
7. Specifications and Drawings

Figure dimension on drawings shall govern over scale dimensions and detailed Drawings shall govern over general Drawings.

3.4 Amending and Supplementing Contract Documents

The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof by means of a Change Order or a Field Order. Contract Price and Contract Time may only be changed by a Change Order.

3.5 Reuse of Documents

Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER shall have or acquire any title to or ownership rights in any

of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of CONSULTANT; and they shall not reuse any of them on extensions of the Project or any other project without written consent of OWNER and CONSULTANT and specific written verification or adaptation by CONSULTANT.

4. AVAILABILITY OF LANDS; PHYSICAL CONDITIONS, REFERENCE POINTS

4.1 Availability of Lands

OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in OWNER'S furnishing these lands, rights-of-way or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 11. CONSULTANT shall determine if the claim is legitimate or not. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 Physical Conditions

4.2.1 Explorations and Reports

Reference is made to the Special Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by CONSULTANT in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon non-technical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

4.2.2 Existing Structures

Reference is made to the Special Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3 which are at or contiguous to the site that have been utilized by CONSULTANT in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to physical conditions in or relating to such structures.

4.2.3 Report of Differing Conditions

If CONTRACTOR believes that:

4.2.3.1 any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2 any physical conditions uncovered or revealed at the site differ materially from that indicated, reflected or referred to in the Contract Documents,

CONTRACTOR shall, promptly after becoming aware thereof and before performing and WORK in connection therewith (except in an emergency) notify OWNER and CONSULTANT in writing about the inaccuracy or difference.

4.2.4 CONSULTANT'S Review

CONSULTANT will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise CONTRACTOR of CONSULTANT'S findings and conclusions.

4.2.5 Possible Document Change

If CONSULTANT concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change I the Contract Documents is required, a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6 Possible Price and Time Adjustments

In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference.

4.3 Physical Conditions-Underground Facilities

4.3.1 Shown or Indicated

The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to OWNER or CONSULTANT by the owners of such underground facilities or by others. Unless it is otherwise expressly provided in the Special Conditions:

4.3.1.1 OWNER and CONSULTANT shall not be responsible for the accuracy or completeness of any such information or data; and,

4.2.1.2 CONTRACTOR shall have full responsibility for reviewing and checking all such information and data; for locating all underground facilities shown or indicated in the Contract Documents; for coordination of the Work with the owners of such underground facilities during construction;

and for the safety and protection thereof and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2 Not Shown or Indicated

If an underground facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency), identify the owner of such Underground Facility and give written notice thereof to that owner and to OWNER and CONSULTANT. CONSULTANT will promptly review the underground facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such underground facility. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any underground facility that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of.

4.4 **Reference Points**

OWNER shall provide engineering surveys to establish reference points for construction which in CONSULTANT'S judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work (unless otherwise specified), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to CONSULTANT whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by a Registered Land Surveyor.

5. **CONTRACTOR'S RESPONSIBILITIES**

5.1 **Supervision**

CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall assure that all CONTRACTOR personnel (including subcontractors, etc.) conduct themselves in a courteous and respectful manner toward the CONSULTANT and the general public. CONTRACTOR shall keep at the Project Site during the progress of the Work a competent project manager/superintendent and all necessary assistants, all of whom shall be

satisfactory to OWNER. OWNER reserves the right to reject CONTRACTOR'S construction superintendent and project management personnel if they are unsatisfactory to OWNER and upon such rejection CONTRACTOR shall designate and provide competent successors. Failure to comply with this condition of the Contract will result in immediate suspension of the Work. Following a review by the Commissioner of Public Works, the Contract may be terminated (see GC section 14). CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

5.2 Superintendence

CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and CONSULTANT except under extraordinary circumstances. The superintendent will be CONTRACTOR'S representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

5.3 Labor

CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. OWNER reserves the right to require CONTRACTOR to remove from the Project any of its personnel, or subcontractor's personnel for violating LFUCG Policies, Rules or Regulations. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER'S written consent given after prior written notice to CONSULTANT.

5.4 Start-Up and Completion of Work

Unless otherwise specified, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

5.5 Materials and Equipment

All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by CONSULTANT,

CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to CONSULTANT, or any of CONSULTANT'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4.

5.5.1 Not Clearly Specified or Indicated

In all instances where materials specified are obtainable in different sizes, weights, trade grades, qualities or finishes, etc., whose weights, trade grades, qualities or finishes, etc., are not clearly specified or indicated on the Drawings, the CONTRACTOR shall notify the CONSULTANT of all such instances at least five (5) days in advance of receiving the proposals. The CONSULTANT will then determine which size, weight, trade grade, quality, finish, etc., is required.

5.5.2 Coordination of Work

The CONTRACTOR shall see that for his own Work and for the work of each subcontractor, proper templates and patterns necessary for the coordination of the various parts of the Work are prepared. The CONTRACTOR shall furnish or require the Subcontractor to furnish such duplicates as will enable the Subcontractors to fit together and execute fully their respective portions of the Work.

5.6 Adjusting Progress Schedule

CONTRACTOR shall submit to CONSULTANT for acceptance (to the extent indicated in paragraph 2.8) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the Contract Documents applicable thereto.

5.7 Substitutes or "Or-Equal" Items

5.7.1 General

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by OWNER/CONSULTANT if sufficient information is submitted by CONTRACTOR to allow OWNER/CONSULTANT to determine that the material or equipment

proposed is equivalent or equal to that named. The procedure for review by OWNER/CONSULTANT will include the following. Requests for review of substitute items of material and equipment will not be accepted by OWNER/CONSULTANT from anyone, other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to OWNER/CONSULTANT for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR'S achievement of completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by OWNER/CONSULTANT in evaluating the proposed substitute. OWNER/CONSULTANT may require CONTRACTOR to furnish at CONTRACTOR'S expense additional data about the proposed substitute.

5.7.2 Substitutes

If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to OWNER/CONSULTANT, if CONTRACTOR submits sufficient information to allow OWNER/CONSULTANT to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by OWNER/CONSULTANT will be similar to that provided in paragraph 5.7.1 as applied by OWNER/CONSULTANT.

5.7.3 OWNER/CONSULTANT'S Approval

OWNER/CONSULTANT will be allowed a reasonable time within which to evaluate each proposed substitute. OWNER/CONSULTANT will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without OWNER/CONSULTANT'S prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at

CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute. OWNER/CONSULTANT will record time required by OWNER/CONSULTANT and OWNER/CONSULTANT'S consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not OWNER/CONSULTANT accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of OWNER/CONSULTANT and OWNER/CONSULTANT'S consultants for evaluating each proposed substitute.

5.8 Subcontractors, Suppliers, and Others

5.8.1 Acceptable to CONSULTANT

CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and CONSULTANT as indicated in paragraph 5.8.2), whether initially or as a substitute, against whom OWNER or CONSULTANT may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

5.8.2 Objection After Due Investigation

If the Contract Documents require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and CONSULTANT and if CONTRACTOR has submitted a list thereof, OWNER'S or CONSULTANT'S acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute. No acceptance by OWNER or CONSULTANT of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or CONSULTANT to reject defective Work.

5.8.3 Contractor Responsible for Acts of Subcontractors

The CONTRACTOR shall perform on the site, and with its own organization, work equivalent to at least fifty (50) percent of the total amount of Work to be performed under the Contract. This percentage may be reduced by a supplemental agreement to this Contract if, during performing the Work, the CONTRACTOR requests a reduction and the Urban County

project manager determines that the reduction would be to the advantage of the Urban County Government.

The CONTRACTOR shall, at the time he submits his proposal for the Contract, notify the OWNER in writing of the names of Subcontractors proposed for the Work. He shall not employ any Subcontractor without the prior written approval of the OWNER.

CONTRACTOR shall be fully responsible to OWNER and CONSULTANT for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR'S own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between OWNER or CONSULTANT and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or CONSULTANT to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

5.8.4 Division of Specifications

The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

5.8.5 Agreement Between Contractor and Subcontractors

All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and CONSULTANT.

5.8.6 Statements and Comments by CONTRACTOR

Neither the CONTRACTOR, his employees, nor his subcontractors shall at any time make any statement or comment as to the project scope, nature, intention, design, or construction method to any third party or parties without the explicit written consent of the OWNER.

Any third party requesting such information shall be referred to the OWNER or his representative.

Should there be any change from the original intent of the project as a result of any statement or comment by the contractor, his employees or subcontractors, contractor shall be held liable for any change in the scope,

nature, design, or construction method and shall bear the full cost for the previously mentioned changes.

5.9 Patent Fees and Royalties

CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others.

5.10 Permits

Unless otherwise provided in the Special conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or if there are no Bids on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

5.11 Laws and Regulations

5.11.1 CONTRACTOR to Comply

CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor CONSULTANT shall be responsible for monitoring CONTRACTOR'S compliance with any Laws and Regulations.

5.11.2 Specifications and Drawings at Variance

If CONTRACTOR observes that the Specifications or Drawings are at variance with any Laws or Regulations, CONTRACTOR shall give CONSULTANT prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Laws, or Regulations, and without such notice to CONSULTANT, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR'S primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

Any party, firm or individual submitting a proposal pursuant to invitation must have paid all taxes owed to the Lexington-Fayette Urban County Government at the time the proposal is submitted, and must maintain a "current" status in regard to those taxes throughout the Contract. If applicable, business must be licensed in Fayette County.

5.12 Taxes

CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work. Any party, firm or individual submitting a proposal pursuant to invitation must have paid all taxes owed to the Lexington-Fayette Urban County Government at the time the proposal is submitted, and must maintain a "current" status in regard to those taxes throughout the Contract. If applicable, business must be licensed in Fayette County.

5.13 Use of Premises

5.13.1 Project Site

CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the staging areas or work site areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against OWNER or CONSULTANT by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER and CONSULTANT harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against OWNER or CONSULTANT to the extent based on a claim arising out of CONTRACTOR'S performance of the Work.

5.13.2 Clean UP

During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

5.13.1 Loading of Structures

CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

5.14 Record Drawings

CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Change Orders, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to CONSULTANT for reference. Upon completion of the Work, these record documents, samples and Shop Drawings will be delivered to CONSULTANT for OWNER.

5.15 Shop Drawings and Samples

5.15.1 Shop Drawing Submittals

After checking and verifying all field measurements and after complying with applicable procedures specified, CONTRACTOR shall submit to CONSULTANT for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.8), or for other appropriate action if so indicated in the Special Conditions, five copies (unless otherwise specified) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as CONSULTANT may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable CONSULTANT to review the information as required.

5.15.2 Sample Submittals

CONTRACTOR shall also submit to CONSULTANT for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

5.15.3 Review by CONTRACTOR

Before submission of each Shop Drawing or sample CONTRACTOR shall have determined and verified all quantities, dimensions, specified

performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

5.15.4 Notice of Variation

At the time of each submission, CONTRACTOR shall give CONSULTANT specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to CONSULTANT for review and approval of each such variation.

5.15.5 CONSULTANT'S Approval

CONSULTANT will review and approve with reasonable promptness Shop Drawings and samples, but CONSULTANT'S review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by CONSULTANT, and shall return the required number of corrected copies of Shop Drawings and submit, as required, new samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by CONSULTANT on previous submittals.

5.15.6 Responsibility for Errors and Omissions

CONSULTANT'S review and approval of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called CONSULTANT'S attention to each such variation at the time of submission as required by paragraph 5.15.4 and CONSULTANT has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any approval by CONSULTANT relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 5.15.3.

5.15.7 Cost of Related Work

Where a Shop or sample is required by the Specifications, any related Work performed prior to CONSULTANT'S review and approval of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

5.16 Continuing the Work

CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolutions of any disputes or disagreements, except as permitted by paragraph 14.5 or as CONTRACTOR and OWNER may otherwise agree in writing.

5.17 Erosion and Sediment Control

5.17.1 General Environmental Requirements

The CONTRACTOR and Subcontractors performing work on projects on behalf of the OWNER shall comply with all applicable federal, state, and local environmental regulations and all requirements and conditions set forth in "special" permits including but not limited to Corp of Engineers 404 permits, 401 Water Quality Certifications, Stream Crossing and Floodplain Encroachment Permits.

Any fines or penalties resulting from the failure to comply with the terms of the federal, state or local permits or perform necessary corrective action are solely the obligation of the CONTRACTOR.

5.17.2 Stormwater Pollution Prevention

A. The CONTRACTOR shall exercise due care to prevent or minimize any damage to any stream or wetland from pollution by debris, sediment or other material. The operation of equipment and/or materials in a jurisdictional wetland is expressly prohibited. Water that has been used for washing or processing, or that contains oils, sediments or other pollutants shall not be discharged from the job site. Such waters shall be collected and properly disposed of by the CONTRACTOR in accordance with applicable local, state and federal law.

B. The CONTRACTOR is solely responsible for securing all required state and local permits associated with stormwater discharges from the project including, but not necessarily limited to the KY Notice of Intent to Disturb (NOI) for Coverage of Storm Water Discharges Associated with Construction Activities under the KPDES Storm Water General Permit KYR100000 and the LFUCG, Land Disturbance Permit. Permit application preparation and all required documentation are the responsibility of the CONTRACTOR. The CONTRACTOR is solely responsible for maintaining compliance with the stormwater pollution prevention plan or erosion and sediment control plan and ensuring the following:

- a. That the Stormwater Pollution Prevention Plan (SWPPP) or erosion control plan is current and available for review on site;

- b. That any and all stormwater inspection reports required by the permit are conducted by qualified personnel and are available for review onsite; and
- c. That all best management practices (BMPs) are adequately maintained and effective at controlling erosion and preventing sediment from leaving the site.

C. The CONTRACTOR shall provide the necessary equipment and personnel to perform any and all emergency measures that may be required to contain any spillage or leakage and to remove materials, soils or liquids that become contaminated. The collected spill material shall be properly disposed at the CONTRACTOR's expense.

D. Upon completion of the work and with the concurrence of the OWNER, the CONTRACTOR must file a Notice of Termination (NOT) of Coverage Under the KPDES General Permit for Storm Water Discharges Associated with Construction Activity with the appropriate local and state authorities.

E. Any fines or penalties resulting from the failure to comply with the terms of the state or local stormwater permits or perform necessary corrective action are solely the obligation of the CONTRACTOR.

6. OTHER WORK

6.1 Related Work at Site

OWNER may perform other work related to the Project at the site by OWNER'S own forces, have other work performed by utility owners or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if such performance will involve additional expense to CONTRACTOR or requires additional time, a Change Order to the Contract will be negotiated.

6.2 Other Contractors or Utility Owners

CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or OWNER, if OWNER is performing the additional work with OWNER'S employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of CONSULTANT and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the

benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

6.3 Delays Caused by Others

If any part of CONTRACTOR'S Work depends for proper execution or results upon the work of any such other contractor or utility owner (or OWNER), CONTRACTOR shall inspect and promptly report to CONSULTANT in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. CONTRACTOR'S failure so to report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR'S Work except for latent or non-apparent defects and deficiencies in the other work.

6.4 Coordination

If OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Special Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Special Conditions.

7. OWNER'S RESPONSIBILITIES

7.1 Communications

OWNER shall issue all communications to CONTRACTOR through CONSULTANT.

7.2 Data and Payments

OWNER shall furnish the data required of OWNER under the Contract Documents promptly after they are due.

7.3 Lands, Easements, and Surveys

OWNER'S duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER'S identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by CONSULTANT in preparing the Drawings and Specifications.

7.4 Change Orders

OWNER is obligated to execute Change Orders as indicated in paragraph 9.4.

7.5 Inspections, Tests and Approvals

OWNER'S responsibility in respect to certain inspections, tests and approvals is set forth in paragraph 13.3.

7.6 Stop or Suspend Work

In connection with OWNER'S right to stop Work or suspend Work, see paragraph 12.4 and 14.1 Paragraph 14.2 deals with OWNER'S rights to terminate services of CONTRACTOR under certain circumstances.

8. CONSULTANT'S STATUS DURING CONSTRUCTION

8.1 OWNER'S Representative

CONSULTANT will be OWNER'S representative during the construction period. The duties and responsibilities and the limitations of authority of CONSULTANT as OWNER'S representative during construction are set forth in the Contract Documents and shall not be extended without written consent of OWNER and CONSULTANT.

8.2 Visits to Site

CONSULTANT will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. CONSULTANT will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. CONSULTANT'S efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform to the Contract Documents. On the basis of such visits and on-site observations, CONSULTANT will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

8.3 Project Representation

CONSULTANT will provide an Inspector to assist CONSULTANT in observing the performance of the Work. If OWNER designates another agent to represent OWNER at the site who is not CONSULTANT'S agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Special Conditions.

8.4 Clarifications and Interpretations

CONSULTANT will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as CONSULTANT may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

8.5 Authorized Variations in Work

CONSULTANT may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order.

8.6 Rejecting Defective Work

CONSULTANT will have authority to disapprove or reject Work which CONSULTANT believes to be defective, and will also have authority to require special inspection or testing of the Work as provided in paragraph 12.3, whether or not the Work is fabricated, installed or completed.

8.7 Shop Drawings

In connection with CONSULTANT'S responsibility for Shop Drawings and samples, see paragraphs 5.15.1 through 5.16 inclusive.

8.8 Change Orders

In connection with CONSULTANT'S responsibilities as to Change Orders, see Articles 10, 11 and 12.

8.9 Payments

In connection with CONSULTANT'S responsibilities with respect to Applications for Payment, etc., see Article 13.

8.10 Determinations for Unit Prices

CONSULTANT will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR.

CONSULTANT will review with CONTRACTOR CONSULTANT'S preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise).

8.11 Decision on Disputes

CONSULTANT will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 10 and 11 in respect of changes in the Contract Price or Contract Time will be referred initially to CONSULTANT in writing with a request for a formal decision in accordance with this paragraph, which CONSULTANT will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered to CONSULTANT promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to CONSULTANT within sixty days after such occurrence unless CONSULTANT allows an additional period of time to ascertain more accurate data in support of the claim.

8.12 Limitations on CONSULTANT's Responsibilities

8.12.1 CONTRACTOR, Supplier, or Surety

Neither CONSULTANTS authority to act under this Article 8 or elsewhere in the Contract Documents nor any decision made by CONSULTANT in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of CONSULTANT to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

8.12.2 To Evaluate the Work

Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives or like "effect" or "import" are used to describe a requirement, direction, review or judgment of CONSULTANT as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign CONSULTANT any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4.

8.12.3 CONTRACTOR'S Means, Methods, Etc.

CONSULTANT will not be responsible for CONTRACTOR'S means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and CONSULTANT will not be responsible for CONTRACTOR'S failure to perform or furnish the Work in accordance with the Contract Documents.

8.12.4 Acts of Omissions of CONTRACTOR

CONSULTANT will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

9. **CHANGES IN THE WORK**

9.1 **OWNER May Order Change**

Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Change Order. Upon receipt of such notice, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

9.2 **Claims**

Claims for an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Change Order will be settled as provided for in Article 10 or Article 11.

9.3 Work Not in Contract Documents

CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraph 3.4, except in the case of an emergency and except in the case of uncovering Work as provided in paragraph 12.3.4.

9.4 Change Orders

OWNER and CONTRACTOR shall execute appropriate Change Orders covering:

9.4.1 changes in the Work which are ordered by OWNER pursuant to paragraph 9.1, are required because of acceptance of defective Work under paragraph 12.7 or corrective defective Work under paragraph 12.8, or are agreed to by the parties;

9.4.2 changes in the Contract Price or Contract Time which are agreed to by the parties; and

9.4.3 changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by CONSULTANT pursuant to paragraph 8.11; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and REGULATIONS, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 5.16.

9.5 Notice of Change

If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR'S responsibility, and the amount of each applicable Bond will be adjusted accordingly.

10. CHANGE OF CONTRACT PRICE

10.1 Total Compensation

The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

10.2 Claim for Increase or Decrease in Price

The Contract Price may only be changed by a Change Order. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the CONSULTANT promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless CONSULTANT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by CONTRACTOR'S written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of the occurrence of said event.

10.3 Value of Work

The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

10.3.1 Unit Prices

Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 10.9.1. through 10.9.3, inclusive).

10.3.2 Lump Sum

By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 10.6.2.1).

10.3.3 Cost Plus Fee

On the basis of the Cost of the Work (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR'S fee for overhead and profit (determined as provided in paragraphs 10.6 and 10.7).

10.4 Cost of the Work

The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project; shall include only the following items; and shall not include any of the costs itemized in paragraph 10.5:

10.4.1 Payroll Costs

Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions,

unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.

10.4.2 Materials and Equipment Costs

Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

10.4.3 Subcontractor Costs

Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of CONSULTANT, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Subcontractor's Cost of the Work shall be determined in the same manner as CONTRACTOR'S Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

10.4.4 Special Consultant Costs

Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

10.4.5 Supplemental Costs

10.4.5.1 The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR'S employees incurred in discharge of duties connected with the Work.

10.4.5.2 Cost, including transportation and maintenance, of all materials, supplies, equipment,

machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of CONTRACTOR.

10.4.5.3 Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of CONSULTANT, and the costs of transportation, loading, unloading, installation, dismantling and removal shall be in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

10.4.5.4 Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

10.4.5.5 Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

10.4.5.6 Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by OWNER), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR'S fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid a fee proportionate to that stated in paragraph 10.6.2 for services.

10.4.5.7 The cost of utilities, fuel and sanitary facilities at the site.

10.4.5.8 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

10.4.5.9 Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER.

10.5 Not to Be Included in Cost of the Work

The term Cost of the Work shall not include any of the following:

10.5.1 Costs of Officers and Executives

Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR'S principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 10.4.1 or specifically covered by paragraph 10.4.4 - all of which are to be considered administrative costs covered by the CONTRACTOR'S fee.

10.5.2 Principal Office

Expenses of CONTRACTOR'S principal and branch offices other than CONTRACTOR'S office at the site.

10.5.3 Capital Expense

Any part of CONTRACTOR'S capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.

10.5.4 Bonds and Insurance

Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 10.4.5.9 above).

10.5.5 Costs Due to Negligence

Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

10.5.6 Other Costs

Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.4.

10.6 Contractor's Fee

The CONTRACTOR'S Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

10.6.1 a mutually acceptable fixed fee; or if none can be agreed upon,

10.6.2 a fee based on the following percentages of the various portions of the Cost of the Work:

10.6.2.1 for costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR'S fee shall be fifteen percent;

10.6.2.2 for costs incurred under paragraph 10.4.3, the CONTRACTOR'S fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be fifteen percent;

10.6.2.3 no fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;

10.6.2.4 the amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR'S Fee by an amount equal to ten percent of the net decrease; and

10.6.2.5 when both additions and credits are involved in any one change, the adjustment in CONTRACTOR'S fee shall be computed on the basis of the net change in accordance with paragraphs 10.6.2.1 through 10.6.2.4, inclusive.

10.7 Itemized Cost Breakdown

Whenever the cost of any Work is to be determined pursuant to paragraph 10.4 or 10.5, CONTRACTOR will submit in form acceptable to CONSULTANT an itemized cost breakdown together with supporting data.

10.8 Cash Allowances

It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within

the limit of the allowances as may be acceptable to CONSULTANT, CONTRACTOR agrees that:

10.8.1 Materials and Equipment

The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

10.8.2 Other Costs

CONTRACTOR'S costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

10.8.3 Change Order

Prior to final payment, an appropriate Change Order will be issued as recommended by CONSULTANT to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

10.9 Unit Price Work

10.9.1 General

Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by CONSULTANT in accordance with Paragraph 8.10.

10.9.2 Overhead and Profit

Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

10.9.3 Claim for Increase in Unit Price

Where the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional

expense as a result thereof, CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 10.

11. CHANGE OF CONTRACT TIME

11.1 Change Order

The Contract Time may only be changed by a Change Order. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered to CONSULTANT promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless CONSULTANT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by CONSULTANT in accordance with paragraph 8.11. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 11.1.

11.2 Justification for Time Extensions

The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if a claim is made therefore as provided in paragraph 11.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 6, or to fires, floods, labor disputes, epidemics, abnormal weather conditions or acts of God.

11.3 Time Limits

All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 11 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) for delay by either party.

12. WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

12.1 Warranty and Guarantee

CONTRACTOR warrants and guarantees to OWNER and CONSULTANT that all Work will be in accordance with the Contract Documents and will not be defective. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 12.

12.2 Access to Work

CONSULTANT and CONSULTANT'S representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests

will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

12.3 Tests and Inspections

12.3.1 Timely Notice
CONTRACTOR shall give CONSULTANT timely notice of readiness of the Work for all required inspections, tests or approvals.

12.3.2 Requirements and Responsibilities
The CONSULTANT may require such inspection and testing during the course of the Work as he/she deems necessary to ascertain and assure the integrity and acceptable quality of the materials incorporated and the work performed. Inspection presence may be either full-time or intermittent, and neither the presence nor absence at any time of the CONSULTANT or the INSPECTOR shall relieve the CONTRACTOR of sole responsibility for the acceptability and integrity of the Work or any part thereof.

The costs of sampling, testing, and inspection on-site to ascertain acceptability of the Work and materials will be borne by the OWNER except as otherwise provided. The OWNER will select a testing laboratory to perform such sampling and testing. Sampling and/or testing required by the CONTRACTOR or necessitated by failure of Work or materials to meet the above acceptability test shall be at the expense of the CONTRACTOR.

Inspection services may be performed by the employees of the OWNER or by others selected or designated by the OWNER or the CONSULTANT.

Sampling and/or testing required for manufacturing quality and/or process control, for certification that raw mineral materials or manufactured products are the quality specified in the contract, or to assure the acceptability for incorporation into the Work shall be borne by the CONTRACTOR or the material supplier.

Cost for inspection, sampling, testing, and approvals required by the laws or regulations of any public body having competent jurisdiction shall be borne by the CONTRACTOR or the material supplier.

Sampling and testing will be in accord with pertinent codes and regulations and with appropriate standards of the American Society of Testing Materials or other specified standards.

12.3.3 On-Site Construction Test and Other Testing
All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by

organizations acceptable to OWNER and CONTRACTOR (or by CONSULTANT if so specified).

12.3.4 Covered Work

If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of CONSULTANT, it must, if requested by CONSULTANT, be uncovered for observation. Such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given CONSULTANT timely notice of CONTRACTOR'S intention to cover the same and CONSULTANT has not acted with reasonable promptness in response to such notice.

12.3.5 CONTRACTOR'S Obligation

Neither observations by CONSULTANT nor inspections, tests or approvals by others shall relieve CONTRACTOR from CONTRACTOR'S obligations to perform the Work in accordance with the Contract Documents.

12.4 OWNER May Stop the Work

If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

12.5 Correction or Removal of Defective Work

If required by CONSULTANT, CONTRACTOR shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by CONSULTANT, remove it from the site and replace it with non-defective Work. CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

12.6 One Year Correction Period

If within one year after the date of Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER'S written instructions, either correct such defective Work, or, if it has been rejected by OWNER, remove it from the site and replace it with non-defective Work. If CONTRACTOR does not promptly comply with the terms of such instructions, or in

an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service before Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Change Order.

12.7 Acceptance of Defective Work

If, instead of requiring correction or removal and replacement of defective Work, OWNER prefers to accept it, OWNER may do so. CONTRACTOR shall bear all direct, indirect and consequential costs attributable to OWNER'S evaluation of and determination to accept such defective Work (such costs to be approved by CONSULTANT as to reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals).

12.8 OWNER May Correct Defective Work

If CONTRACTOR fails within a reasonable time after written notice of CONSULTANT to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by CONSULTANT in accordance with paragraph 12.5, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR'S services related thereto, take possession of CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER'S representatives, agents and employees such access to the site as may be necessary to enable OWNER to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by CONSULTANT, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR'S defective Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of

the Work attributable to the exercise by OWNER of OWNER'S rights and remedies hereunder.

13. PAYMENTS TO CONTRACTOR AND COMPLETION

13.1 Schedule of Values

The schedule of values established as provided in paragraph 2.8 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to CONSULTANT. Progress payments on account of Unit Price Work will be based on the number of units completed.

13.2 Application for Progress Payment

At least ten days before each progress payment is scheduled (but not more often than once a month), CONTRACTOR shall submit to CONSULTANT for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that OWNER has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER'S interest therein, all of which will be satisfactory to OWNER. OWNER shall, within thirty (30) calendar days of presentation to him of an approved Application for Payment, pay CONTRACTOR the amount approved by CONSULTANT. Monthly progress payments shall be ninety (90) percent of the sum obtained by applying the respective bid unit prices to the approved estimated quantities of work completed by the Contractor during the preceding month. The remaining ten (10) percent will be held by the Owner, as retainage. At such time as the CONSULTANT deems appropriate - based on the quality of work performed, progress of cleanup, and other pertinent factors - the rate of retainage, or the total amount retained, may be reduced; although, any reduction in retainage, below the ten (10) percent level, is made solely at the CONSULTANT's discretion. All remaining retainage held will be included in the final payment to the Contractor.

13.2.1 Waivers of Mechanic's Lien

With each Application for Payment OWNER may require CONTRACTOR to submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

13.2.1.1 Requirement for waivers of Mechanic's Lien on Partial Applications for Payment will be determined and communicated at the Preconstruction Conference.

13.2.1.2 Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

13.2.1.3 When an application shows completion of an item, submit conditional final or full waivers.

13.2.1.4 Owner reserves the right to designate which entities involved in the Work must submit waivers.

13.2.1.5 Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

13.3 CONTRACTOR'S Warranty of Title

CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

13.4 Review of Applications for Progress Payment

13.4.1 Submission of Application for Payment

CONSULTANT will, after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER, or return the Application to CONTRACTOR indicating in writing CONSULTANT'S reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

13.4.2 CONSULTANT'S Recommendation

CONSULTANT may refuse to recommend the whole or any part of any payment, if, in CONSULTANT'S opinion, it would be incorrect to make such representations to OWNER. CONSULTANT may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in CONSULTANT'S opinion to protect OWNER from loss because:

13.4.2.1 the Work is defective, or completed Work has been damaged requiring correction or replacement;

13.4.2.2 the Contract Price has been reduced by Written Amendment or Change Order;

13.4.2.3 OWNER has been required to correct defective Work or complete Work in accordance with paragraph 12.8; or

13.4.2.4 of CONSULTANT's actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.2.1 through 14.2.9 inclusive.

13.5 Partial Utilization

OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and has been completed. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER that said part of the Work is complete and request that a Certificate of Completion be issued for that part of the Work.

13.6 Final Inspection

Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, CONSULTANT will make a final inspection with CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

13.7 Final Application for Payment

After CONTRACTOR has completed all such corrections to the satisfaction of CONSULTANT and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 5.14) and other documents - all as required by the Contract Documents, and after CONSULTANT has indicated that the Work is acceptable (subject to the provisions of paragraph 13.10), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER'S property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to

furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

13.8 Final Payment and Acceptance

13.8.1 CONSULTANT'S Approval

If, on the basis of CONSULTANT'S observation of the Work during construction and final inspection, and CONSULTANT'S review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents, CONSULTANT is satisfied that the Work has been completed and CONTRACTOR'S other obligations under the Contract Documents have been fulfilled, CONSULTANT will, after receipt of the final Application for Payment, indicate in writing CONSULTANT'S recommendation of payment and present the Application to OWNER for payment. Thereupon CONSULTANT will give written notice to OWNER and CONTRACTOR that the Work is acceptable, subject to the provisions of paragraph 13.10. Otherwise, CONSULTANT will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application.

13.8.2 Delay in Completion of Work

If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, OWNER shall, upon receipt of CONTRACTOR'S final Application for Payment and recommendation of CONSULTANT, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 10 of Part II, Information for Bidders, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to CONSULTANT with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

13.9 CONTRACTOR'S Continuing Obligation

CONTRACTOR'S obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by CONSULTANT, nor the issuance of a certificate of Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor any correction of defective Work by OWNER will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR'S obligation to perform the

Work in accordance with the Contract Documents (except as provided in paragraph 13.10).

13.10 Waiver of Claims

The making and acceptance of final payment will constitute:

13.10.1 a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from defective Work appearing after final inspection or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by OWNER of any rights in respect of CONTRACTOR'S continuing obligations under the Contract Documents; and

13.10.2 a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

14. SUSPENSION OF WORK AND TERMINATION

14.1 OWNER May Suspend Work

OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and CONSULTANT which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 10 and 11.

14.2 OWNER May Terminate

The OWNER may terminate the Work upon the occurrence of any one or more of the following events:

14.2.1 if CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

14.2.2 if a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

14.2.3 if CONTRACTOR makes a general assignment for the benefit of creditors;

14.2.4 if a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR'S creditors;

14.2.5 if CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

14.2.6 if CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.8 as revised from time to time);

14.2.7 if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

14.2.8 if CONTRACTOR disregards the authority of CONSULTANT, or

14.2.9 if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be approved as to reasonableness by CONSULTANT and incorporated in a Change Order,

but when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

14.2.10 If safety violations are observed and brought to the Contractors attention and Contractor fails to take immediate corrective measures any repeat of similar safety violations, Owner will order an immediate termination of contract. Note: it is the Contractor's responsibility to know proper safety measures as they pertain to construction and OSHA.

14.2.11 This contract may be canceled by either party thirty (30) days after delivery by canceling party of written notice of intent to cancel to the other contracting party.

14.2.12 This contract may be canceled by the Lexington-Fayette Urban County Government if it is determined that the Bidder has failed to perform under the terms of this agreement, such cancellation to be effective upon receipt of written notice of cancellation by the Bidder.

14.3 CONTRACTOR'S Services Terminated

Where CONTRACTOR'S services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

14.4 Payment After Termination

Upon seven days' written notice to CONTRACTOR, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

14.5 CONTRACTOR May Stop Work or Terminate

If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or CONSULTANT fails to act on any Application for Payment within sixty days after it is submitted, or OWNER fails for sixty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and CONSULTANT, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if CONSULTANT has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' written notice to OWNER and

CONSULTANT stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations under paragraph 5.16 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

15. MISCELLANEOUS

15.1 Claims for Injury or Damage

Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 15.1 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

15.2 Non-Discrimination in Employment

The CONTRACTOR shall comply with the following requirements prohibiting discrimination:

15.2.1 That no person (as defined in KRS 344.010) shall bid on Lexington-Fayette Urban County Government construction projects, or bid to furnish materials or supplies to the Lexington-Fayette Urban County Government, if, within six months prior to the time of opening of bids, said person shall have been found, by declaratory judgment action in Fayette Circuit Court, to be presently engaging in an unlawful practice, as hereinafter defined. Such declaratory judgment action may be brought by an aggrieved individual or upon an allegation that an effort at conciliation pursuant to KRS 344.200 has been attempted and failed, by the Lexington-Fayette County Human Rights Commission.

15.2.2 That it is an unlawful practice for an employer:

15.2.2.1 to fail or refuse to hire, or to discharge any individual or otherwise to discriminate against an individual, with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, sex, age, or national origin; or

15.2.2.2 to limit, segregate or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee because of such individual's sex, race, color, religion, age, or national origin.

15.2.3 That it is an unlawful practice for an employer, labor organization, or joint-labor management committee controlling apprenticeship or other training or retraining, including on-the-job training programs to discriminate against an individual because of his race, color, religion, sex, age, or national origin in admission to, or employment in, any program established to provide apprenticeship or other training.

15.2.4 That a copy of this Ordinance shall be furnished all suppliers and made a part of all bid specifications.

15.2.5 This Ordinance shall take effect after it is signed, published and recorded, as required by law.

15.3 Temporary Street Closing or Blockage

The CONTRACTOR will notify the CONSULTANT at least 72 hours prior to making any temporary street closing or blockage. This will permit orderly notification to all concerned public agencies. Specific details and restrictions on street closure or blockage are contained in the Special Conditions.

15.4 Percentage of Work Performed by prime CONTRACTOR

The CONTRACTOR shall perform on site, and with its own organization, Work equivalent to at least fifty (50%) percent of the total amount of Work to be performed under the Contract. This percentage may be reduced by a supplemental agreement to this Contract if, during performing the Work, the CONTRACTOR requests a reduction and the CONSULTANT determines that the reduction would be to the advantage of the OWNER.

15.5 Clean-up

Cleanup shall progress, to the greatest degree practicable, throughout the course of the Work. The Work will not be considered as completed, and final payment will not be made, until the right-of-way and all ground occupied or affected by the Contractor in connection with the Work has been cleared of all rubbish, equipment, excess materials, temporary structures, and weeds. Rubbish and all waste materials of whatever nature shall be disposed of, off of the project site, in an acceptable manner. All property, both public and private, which has been damaged in the prosecution of the Work, shall be restored in an acceptable manner. All areas shall be draining, and all drainage ways shall be left unobstructed, and in such a condition that drift will not collect or scour be induced.

15.6 General

The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 12.1, 12.3.5, 13.3, and 15.2 and all of the rights and remedies available to OWNER and CONSULTANT thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies

available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

15.7 Debris Disposal

For all LFUCG projects any trash, construction demolition debris, yard waste, dirt or debris of any kind that is removed from the project site must be disposed of in accordance with local, state, and federal regulations. The disposal site or facility must be approved in advance by the LFUCG and disposal documentation is required. The Contractor will be responsible for payment of any fines associated with improper disposal of material removed from the project site.

END OF SECTION

PART V
SPECIAL CONDITIONS
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- 1 BLASTING
- 2 RISK MANAGEMENT PROVISIONS --
INSURANCE AND INDEMNIFICATION
- 3 WAGE SCALE
- 4 WEATHER RELATED DELAYS

1. **BLASTING** – not applicable.

2. RISK MANAGEMENT PROVISIONS
INSURANCE AND INDEMNIFICATION

DEFINITIONS

(1) The CONTRACTOR understands and agrees that the Risk Management Provisions of this Contract define the responsibilities of the CONTRACTOR to the OWNER.

(2) As used in these Risk Management Provisions, the terms "CONTRACTOR" and "OWNER" shall be defined as follows:

a. "CONTRACTOR" means the contractor and its employees, agents, servants, owners, principals, licensees, assigns and subcontractors of any tier.

b. "OWNER" means the Lexington-Fayette Urban County Government (LFUCG) and its elected and appointed officials, employees, agents, boards, consultants, assigns, volunteers and successors in interest.

c. OWNER/ENGINEER's Consultant means Strand Associates, Inc.[®]

Strand Associates, Inc.[®] provided design services for the Project, which included preparation of Contract Documents, and will provide services during construction consisting of: responding to questions of OWNER and ENGINEER about the Contract Documents; preparing change orders as needed; providing shop drawing review; and reviewing CONTRACTOR progress pay requests. Strand Associates, Inc.[®] shall be provided with the same indemnification by CONTRACTOR as is provided for OWNER in the Contract Documents and shall be listed as an additional insured as is provided for OWNER in the Contract Documents. Excepting those noted above, no other duties or responsibilities shall be construed from the Contract Documents as being the obligation of Strand Associates, Inc.[®]

INDEMNIFICATION AND HOLD HARMLESS PROVISION

(1) It is understood and agreed by the parties that Contractor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Contractor or its employees, agents, servants, owners, principals, licensees, assigns or subcontractors of any tier (hereinafter "CONTRACTOR") under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.

(2) CONTRACTOR shall indemnify, save, hold harmless and defend the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, volunteers, and successors in interest (hereinafter "LFUCG") from and against all

liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by CONTRACTOR's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the CONTRACTOR; and (b) not caused solely by the active negligence or willful misconduct of LFUCG.

(3) In the event LFUCG is alleged to be liable based upon the above, CONTRACTOR shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by LFUCG, which approval shall not be unreasonably withheld.

(4) These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this agreement.

(5) LFUCG is a political subdivision of the Commonwealth of Kentucky. CONTRACTOR acknowledges and agrees that LFUCG is unable to provide indemnity or otherwise save, hold harmless, or defend the CONTRACTOR in any manner.

FINANCIAL RESPONSIBILITY

BIDDER/CONTRACTOR understands and agrees that it shall, prior to final acceptance of its bid and the commencement of any work, demonstrate the ability to assure compliance with the above Indemnity provisions and these other risk management provisions.

INSURANCE REQUIREMENTS

YOUR ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW, AND YOU MAY NEED TO CONFER WITH YOUR INSURANCE AGENTS, BROKERS, OR CARRIERS TO DETERMINE IN ADVANCE OF SUBMISSION OF A RESPONSE THE AVAILABILITY OF THE INSURANCE COVERAGES AND ENDORSEMENTS REQUIRED HEREIN. IF YOU FAIL TO COMPLY WITH THE INSURANCE REQUIREMENTS BELOW, YOU MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Required Insurance Coverage

BIDDER/CONTRACTOR shall procure and maintain for the duration of this contract the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to LFUCG in order to protect LFUCG against claims for injuries to persons or damages to property which may

arise from or in connection with the performance of the work hereunder by CONTRACTOR. The cost of such insurance shall be included in any bid:

<u>Coverage</u>	<u>Limits</u>
General Liability	\$1 million per occurrence, \$2 million aggregate
Commercial Automobile Liability	\$1 million per occurrence
Worker's Compensation	Statutory
Employer's Liability	\$100,000.00
Excess/Umbrella Liability	\$10 million per occurrence
Professional (E&O) Liability	\$1 million per claim

The policies above shall contain the following conditions:

- a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky (DOI). LFUCG shall be named as an additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.
- b. The General Liability Policy shall be primary to any insurance or self-insurance retained by LFUCG.
- c. The General Liability Policy shall include a Products and Completed Operations endorsement or Premises and Operations Liability endorsement unless it is deemed not to apply by LFUCG.
- d. LFUCG shall be provided at least 30 days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.
- e. Said coverage shall be written by insurers acceptable to LFUCG and shall be in a form acceptable to LFUCG. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.

Renewals

After insurance has been approved by LFUCG, evidence of renewal of an expiring policy must be submitted to LFUCG, and may be submitted on a manually signed renewal

endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

Deductibles and Self-Insured Programs

IF YOU INTEND TO SUBMIT A SELF-INSURANCE PLAN IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE RESPONSE DATE. Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of BIDDER/CONTRACTOR's financial capacity to respond to claims. Any such programs or retentions must provide LFUCG with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage. If BIDDER/CONTRACTOR satisfies any portion of the insurance requirements through deductibles, self-insurance programs, or self-insured retentions, BIDDER/CONTRACTOR agrees to provide Lexington-Fayette Urban County Government, Division of Risk Management, the following data prior to the final acceptance of bid and the commencement of any work:

- a. Latest audited financial statement, including auditor's notes.
- b. Any records of any self-insured trust fund plan or policy and related accounting statements.
- c. Actuarial funding reports or retained losses.
- d. Risk Management Manual or a description of the self-insurance and risk management program.
- e. A claim loss run summary for the previous five (5) years.
- f. Self-Insured Associations will be considered.

Safety and Loss Control

CONTRACTOR shall comply with all applicable federal, state, and local safety standards related to the performance of its works or services under this Agreement and take necessary action to protect the life, health and safety and property of all of its personnel on the job site, the public, and LFUCG.

Verification of Coverage

BIDDER/CONTRACTOR agrees to furnish LFUCG with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf prior to final award, and if requested, shall provide LFUCG copies of all insurance policies, including all endorsements.

Right to Review, Audit and Inspect

CONTRACTOR understands and agrees that LFUCG may review, audit and inspect any and all of its records and operations to insure compliance with these Insurance Requirements.

Additional Insured Endorsement

- a. CONTRACTOR shall purchase and maintain liability insurance, as described above, specifically naming as additional insureds OWNER, ENGINEER, and OWNER/ENGINEER's Consultant as well as other individuals or entities identified, using Additional Insurance Endorsement Form CG 20 26 07 04, CG 20 10 07 04, or equivalent form. General liability policies shall also be endorsed with Form CG 20 37 07 04 to include the "products-completed operations hazard." Endorsements or General Liability policy shall not exclude supervisory or inspection services. CONTRACTOR shall also provide an Additional Insured Endorsement for the automobile policy.
- b. CONTRACTOR shall, prior to the start of any work on the project by an subcontractor receive: (1) a certificate of insurance from each subcontractor naming OWNER, ENGINEER, and OWNER/ENGINEER's Consultant as well as other individuals and entities so identified as an additional insured, under each subcontractor's general liability for policy; and (2) the Additional Insured Endorsement language as required by paragraph 1 for subcontractor's operations. Certificate shall be Acord 25-S or equivalent.
- c. That failure of CONTRACTOR or subcontractor to comply with the above requirements with respect to the Additional Insured Endorsement and/or Certificate of Insurance, shall not be construed as waiver of those provisions by OWNER, ENGINEER, and OWNER/ENGINEER's Consultant as well as other individuals and entities so identified.

DEFAULT

BIDDER/CONTRACTOR understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default and that LFUCG may elect at its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging

BIDDER/CONTRACTOR for any such insurance premiums purchased, or suspending or terminating the work.

00357187

3. WAGE SCALES – NOT APPLICABLE.

4. WEATHER RELATED DELAYS

- A. The Project Completion date shall be established with the understanding that no extension of time will be granted for weather related delays that are within the average temperature or number of rain or snow days within a particular month. The average weather conditions shall be established by referencing the records of the National Oceanic and Atmospheric Administration (NOAA) and as defined herein.
- B. Extensions of inclement weather shall be granted only when the work affected must be on schedule at the time of delay. No time will be granted for work which is behind schedule in excess of the actual delay caused by the weather, assuming the work had been on schedule.
- C. Time granted for weather delays shall be requested on a monthly basis.
- D. The weather experienced at the project site during the contract period must be found to be unusually severe, that is more severe than the adverse weather anticipated for the project location during any given month. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.
- E. The anticipated adverse weather delays shall be based on the National Oceanic and Atmospheric Administration (NOAA) climatography ten year average for the Lexington Bluegrass Airport KY US location. The Mean Number of Days of daily precipitation using ≥ 0.10 will determine the base line for monthly anticipated adverse weather evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities. Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record the occurrence of actual adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical path activities for 50 percent or more of the contractor's scheduled work date. The number of actual adverse weather delay days shall be calculated chronologically from the first to the last day of each month, and be recorded as full days. The number of actual adverse weather days greater than the number of anticipated adverse weather days, listed above, shall be the number of unusually severe weather days for the purposes of any contract extensions (actual adverse weather days - anticipated adverse weather days = unusually severe weather days.)
- F. Definitions:
1. "Unusually severe weather" - weather that is more severe than the adverse weather anticipated for the season or location involved.
 2. "Adverse weather" - atmospheric conditions at a definite time and place that are unfavorable to construction activities.

END OF SECTION

PART VI
CONTRACT AGREEMENT
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PART VI

CONTRACT AGREEMENT

THIS AGREEMENT, made on the 6th day of June, 2024, by and between **Lexington-Fayette Urban County Government**, acting herein called "OWNER" and **Haire Construction**, doing business as a corporation located in the City of Louisville, County of Jefferson, and State of Kentucky, hereinafter called "CONTRACTOR."

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of three million twenty-three thousand six hundred eighty Dollars (\$3,023,680.00) quoted in the proposal by the CONTRACTOR, dated May 3, 2024, hereby agree to commence and complete the construction described as follows:

1. SCOPE OF WORK

The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, and the Special Conditions of the Contract, the Specifications and Contract Documents therefore as prepared by Element Design for the **Phoenix Park Reimagined Construction** project.

2. TIME OF COMPLETION

The time estimated and authorized by the OWNER for the proper execution of the Work by the Contract, in full, is hereby fixed as two hundred ten (210) days to substantial completion and an additional thirty (30) calendar days to final completion. The time shall begin in accordance with the Notice to Proceed provided by OWNER.

3. ISSUANCE OF WORK ORDERS

Notice to begin Work will be given in whole or for part of the Work as determined by the OWNER pending the availability of funds. The order of construction will be as determined after consultation between the CONTRACTOR and the OWNER.

4. THE CONTRACT SUM

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the Contract, as quoted in the proposal, subject to any additions and deductions, as provided therein.

5. PROGRESS PAYMENTS

The OWNER shall make payments on account of the Contract, as provided in accordance with the General Conditions, less the aggregate of previous payments.

6. ACCEPTANCE AND FINAL PAYMENT

Final payment shall be due within ninety (90) days after completion of the Work, provided the Work be then fully completed and the Contract fully accepted.

Before issuance of final certificate, the CONTRACTOR shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the Work has been paid.

If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the CONTRACTOR, the OWNER shall without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

7. THE CONTRACT DOCUMENTS

The Advertisement for Bids, Information for Bidders, the General Conditions, Performance and Payment Bonds, Contract Agreement, Special Conditions, Technical Specifications, any and all Addenda, and Proposal, Ion Wave Q&A, and Plan Drawings form the Contract, and they are fully a part of the Contract as if hereto attached or herein repeated.

8. EXTRA WORK

The OWNER, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the Work, the Contract Sum being adjusted accordingly. All such Work shall be executed and paid for in accordance with the General Conditions, which is a part of this Contract.

9. THE FOLLOWING IS AN ENUMERATION OF THE SPECIFICATIONS AND DRAWINGS (CONTRACT DOCUMENTS):

SPECIFICATIONS

**SECTION
NO.**

TITLE

I	Advertisement for Bids
II	Information for Bidders
III	Form of Proposal
IV	General Conditions
V	Special Conditions
VI	Contract Agreement
VII	Performance and Payment Bonds
VIII	Addenda
IX	Technical Specifications and Drawings

IN WITNESSETH WHEREOF, the parties hereto have executed this Contract as of the date and year above written.

(Seal)

Lexington-Fayette Urban County Government.

Lexington, Kentucky

(Owner)

Linda Gorton

ATTEST:

[Signature]

Clerk of the Urban County Council

BY: _____

MAYOR

[Signature]

(Witness)

(Title)

(Seal)

HAIRE CONSTRUCTION LLC

(Contractor)

[Signature]

(Secretary)*

BY: _____

[Signature]

[Signature]

(Witness)

OWNER

(Title)

11214 DECIMAL DR 40299

(Address and Zip Code)

IMPORTANT: *Strike out any non-applicable terms.

Secretary of the Owner should attest. If the CONTRACTOR is corporation, Secretary should attest. Give proper title of each person-executing Contract.

PART VII

PERFORMANCE AND PAYMENT BONDS

1. PERFORMANCE BOND
2. PAYMENT BOND

PART VII

SUR2006588

Bond Number: _____

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT: that

Haire Construction, LLC

(Name of Contractor)

11214 Decimal Dr, Louisville, KY 40299

(Address of Contractor)

a Limited Liability Company hereinafter

(Corporation, Partnership or Individual)

called Principal, and Frankenmuth Insurance Company

(Name of Surety)

One Mutual Avenue, Frankenmuth, MI 48787-0001

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto:

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

Obligee, hereinafter called OWNER, for the use and benefit of claimants as hereinafter defined, in the amount of Three Million Twenty-Three Thousand Six Hundred Eighty and 00/100 Dollars (\$3,023,680.00) the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into a Contract with OWNER for Phoenix Park Reimagined Construction in accordance with drawings and specifications prepared by: Element Design which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

2. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.
3. No suit or action shall be commenced hereunder by any claimant:
 - (a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the Work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.
 - (b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
 - (c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.
4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against aid improvement, whether or not claim for the amount of such lien be presented under and against this bond.

IN WITNESS WHEREOF, this instrument is executed in triplicate counterparts, each one of
(number)

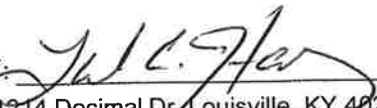
which shall be deemed an original, this the 1st day of May, 2024.


ATTEST:


(Principal) Secretary

(SEAL)

Haire Construction, LLC
(Principal)

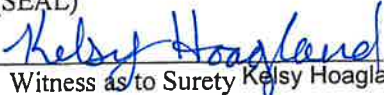
BY:  (s)
11214 Decimal Dr, Louisville, KY 40299
(Address)


(Witness to Principal)
11214 Decimal Dr
(Address)
Louisville, KY 40299


ATTEST:


(Surety) Secretary Amy Smith

(SEAL)


Witness as to Surety Kelsy Hoagland
Acrisure, LLC
(Address)
2307 River Road, Suite 200, Louisville, KY 40206

Frankenmuth Insurance Company
(Surety)

BY: 
(Attorney-in-Fact) Brook T. Smith

One Mutual Avenue
(Address)
Frankenmuth, MI 48787-0001

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Contract.

END OF SECTION

FRANKENMUTH INSURANCE COMPANY

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that Frankenmuth Insurance Company (the "Company"), a corporation duly organized and existing under the laws of the State of Michigan, having its principal office at 1 Mutual Avenue, Frankenmuth, Michigan 48787, does hereby nominate, constitute and appoint:

Brook T. Smith, James T. Smith, Michael W. Dix, Jason D. Cromwell, Raymond M. Hundley, Deborah S. Neichter, William Precious, Ryan Britt, Mark Guidry, Theresa Hintzman, Jennifer Edwards, Susan Ritter, Lynnette Long, Leigh Mccarthy, Amy Smith, Barbara Duncan, Beth Frymire, Jill Kemp, Jacob Motto

Their true and lawful attorney(s)-in-fact, each in their separate capacity if more than one is named above, to make, execute, seal, acknowledge and deliver any and all bonds, contracts and undertakings of suretyship, with the exception of Financial Guaranty Insurance, provided, however, that the penal sum of any one such instrument shall not exceed the sum of:

Fifty Million and 00/100 Dollars (\$50,000,000)

This Power of Attorney is granted pursuant to the following Resolution duly adopted at a meeting of the Board of Directors of Frankenmuth Insurance Company:

"RESOLVED, that the President, Senior Vice President or Vice President and each of them under their respective designations, hereby is authorized to execute powers of attorney, and such authority can be executed by use of facsimile signature, which may be attested or acknowledged by any officer of the Company, qualifying the attorney(s) named in the given power of attorney, to execute on behalf of, and acknowledge as the act and deed of Frankenmuth Insurance Company on all bonds, contracts and undertakings of suretyship, and to affix the corporate seal thereto."

IN WITNESS WHEREOF, the Company has caused these presents to be signed and attested by its appropriate officers and its corporate seal herunto affixed this 15th day of December, 2022.



Frankenmuth Insurance Company

By Frederick A. Edmond, Jr.
Frederick A. Edmond, Jr.,
President and Chief Executive Officer

STATE OF MICHIGAN)
COUNTY OF SAGINAW) ss:

Sworn to before me, a Notary Public in the State of Michigan, by Frederick A. Edmond, Jr., to me personally known to be the individual and officer described in, and who executed the preceding instrument, deposed and said the Corporate Seal and his signature as Officer were affixed and subscribed to said instrument by the authority of the Company.

IN TESTIMONY WHEREOF, I have set my hand, and affixed my Official Seal this 15th day of December, 2022.

Susan L. Fresorger (Seal)
Susan L. Fresorger, Notary Public
Saginaw County, State of Michigan
My Commission Expires: April 3, 2028



I, the undersigned, Executive Vice President of Frankenmuth Insurance Company, do hereby certify that the foregoing is a true, correct and complete copy of the original Power of Attorney; that said Power of Attorney has not been revoked or rescinded and is in full force and effect as of this date.

IN WITNESS WHEREOF, I have set my hand and affixed the Seal of the Company, this 1st day of June, 2024

Andrew H. Knudsen
Andrew H. Knudsen, Executive Vice President,
Chief Operating Officer and Secretary

**ALL CORRESPONDENCE RELATED TO BOND VALIDATION AND/OR A CLAIM SHOULD BE DIRECTED TO
VP SURETY, 701 U.S. ROUTE ONE, SUITE 1, YARMOUTH, ME 04096**



ADDENDUM #1

Bid Number: #24-2024

Date: April 29, 2024

Subject: Phoenix Park Reimagined Construction Project

Address Inquiries to:
Sondra Stone
ssone@lexingtonky.gov

TO ALL PROSPECTIVE SUBMITTERS:

Please be advised of the following clarifications to the above referenced bid:

1. See attached pre-bid sign-in sheet.

DRAWING REVISIONS:

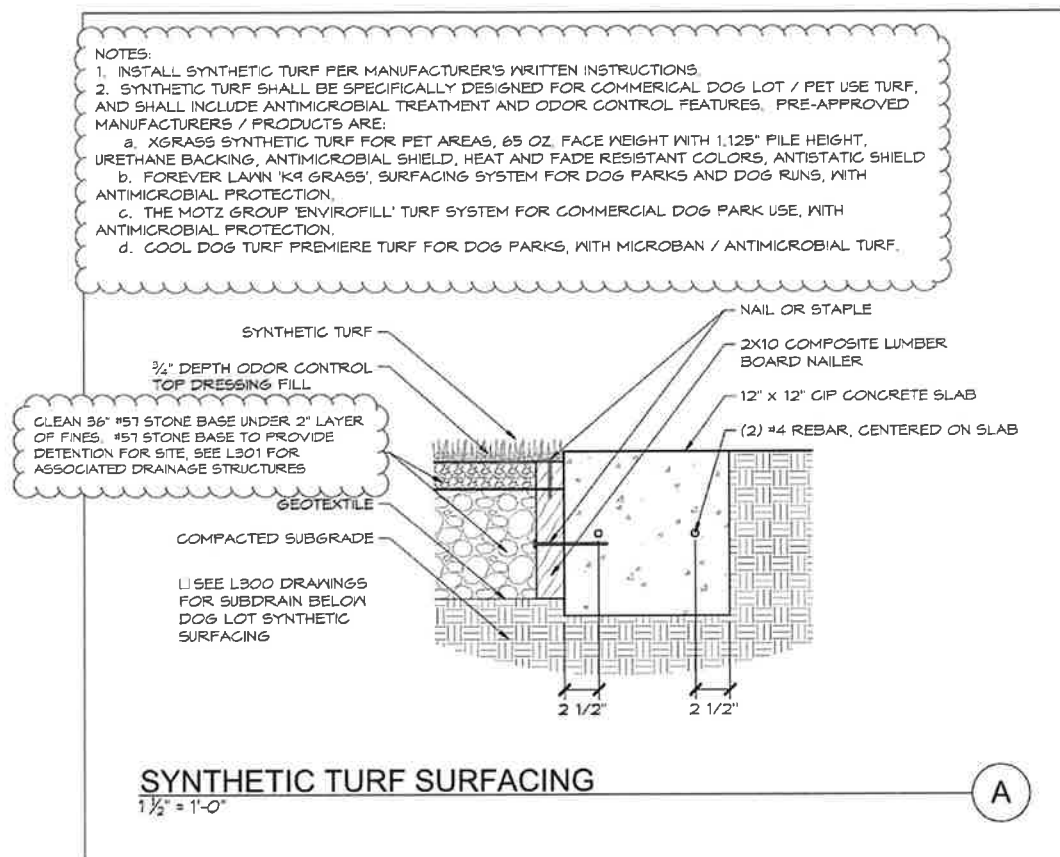
1. Refer to the Drawings, CVR, Cover Sheet, and notes regarding Allowance No. 1 Modular Restroom Building. Note that the \$275,000 Allowance shall also include any gravel base below the concrete pad / base for the modular restroom building if required by the manufacturer. The base bid shall include grading to 12" below finish grade at the Modular Restroom Building site.
2. Refer to the Drawings, L000, Site Logistics Plan and attached revised L000 for the following:
 - a. Added area for contractor parking stating at eight (8) existing parallel parking spaces at Limestone Street, adjacent to the site. These will become part of the Contractor's work site as of June 1, 2024. The contractor shall be responsible for providing signage to indicate to the public that these spaces are not available for parking and are part of the construction site. The contractor shall also be responsible for any permitting, temporary fence, cones, barrels etc. as they feel is needed to keep others from parking in these spaces. Any barriers used shall be compliant with the requirements of LFUCG Traffic Engineering for temporary construction barriers as this part of Limestone Street is an LFUCG street.
 - b. Note that all permanent, 6' construction fence shall have privacy screen.
 - c. Revision to Site Logistics Note A.
3. Refer to the Drawings, L200, Site Demolition Plan, Keynote 11 regarding existing monuments to remain. Note there is one existing Rotary Club historic marker sign that will remain in landscape area, protect during construction. There are three existing monuments "1961"



monument sign, "Zero Mile Marker" monument and Lexington directional sign, that will all remain in place and be protected throughout construction. "1961" and "Zero Mile Marker" will be in new concrete pavement. Lexington directional sign base will remain and be partially in new landscape bed.

4. Refer to the Drawings, L301, Site Drainage Plan, and attached revised L301 for addition of Outlet Structure 1, OS-1, in stone detention area below Dog Lot. See also added Keynote 10 to note depth of #57 stone beneath Dog Lot synthetic turf.
5. Refer to the Drawings, L402 Keynote 11 refers to specialty form liner finish. Revise this note to indicate "New cast in place concrete wall with smooth rubbed finish and integral color, see Details J-N/L601." On Detail J/L601, also remove reference to architectural / specialty form liner finish and revise to smooth rubbed finish.
6. Refer to the Drawings, L500 Site Landscape Plan and L502 Site Irrigation Plan. Note the scale of the drawings is indicated as 1"=20' on these two drawings, this scale is incorrect. Revise the scale to note the drawing scale is 1"=10'.
7. Refer to the Drawings, L600, and attached revised L600 for added detail for OS-1, Outlet Structure 1.
8. Refer to the Drawings, Detail A/L603. See below for revisions to Detail A, Dog Lot Synthetic turf surfacing. Revisions include:
 - a. Additional #57 stone below synthetic turf system to be used for onsite detention.
 - b. Notes for pre-approved manufacturer's / products, including:
 - i. XGrass Synthetic Turf for Pet Areas
 - ii. Forever Lawn K9 Grass Surfacing System for Dog Parks and Dog Runs
 - iii. The Motz Group Envirofill Turf System for Commercial Dog Parks
 - iv. Cool Dog Turf Premier Turf for Dog Parks
 - c. Note also that the synthetic turf manufacturer's standard warranty for their turf product shall be included in the project close out documents (in addition to the typical 1 year project warranty).





Revised detail A/L603

9. Refer to the Drawings, L604 and attached revised L604 for revisions to Details A-C screen fencing at utility yard for revisions to height of screen fence, additional notes about installation and revision to note tube size as 1.5" dia solid steel tube. Powdercoat colors shall be RAL colors, maximum of 5.
10. Refer to the Drawings, E011 Electrical Site Plan and E701 Electrical Details and Schedule and attached revised E011 and E701 for clouded revisions, updated power and panelboard requirements.

PROJECT MANUAL / SPECIFICATIONS REVISIONS:

1. Refer to the Form of Proposal, Page P-13, paragraph one noting "Bidders are hereby advised that this list must be complete and submitted with the Bid. Cut sheets for all mechanical systems must be included with the bid submittal." Strike the second sentence, referring to cut sheets for mechanical systems, this sentence does not apply to



this project and no cut sheets will be required with the Bid.

- 2. Refer to the Specifications, Section 04 4300 Stone Masonry. Under Section 1.4 Quality Assurance, Part B add Item 2. For each proposed source of stone material, the Contractor shall identify the location and allow the opportunity for the Landscape Architect and the Owner to review the material prior to use on site.
- 3. Refer to the Specifications, Section 13 0000 Fog System. Note that the Contractor shall provide Owner training on the Fog System to include maintenance and operations and winterization. Training manuals as well as a recorded training session shall also be provided to the Owner.
- 4. Refer to the Specifications, Section 26 27 26 Wiring Devices: Append to Section 2.3 POWER PEDESTALS. Subsection is to read as follows:
 - J. Food Truck Pedestals are to be TL410 Series with installed (1) weather resistant single, 50A, 125/240V, NEMA 14-50R receptacle, (1) weather resistant single, 30A, 125V, NEMA 5-30R receptacle, and (1) GFCI weather resistant duplex, 20A, 125V, NEMA 5-20R receptacle.
 - K. Provide blank cover for unused knockouts in all power pedestals.
- 5. Refer to the Specifications, Section 32 8400 Plant Irrigation. Note that the Contractor shall provide Owner training on the Irrigation System to include maintenance and operations and winterization. Training manuals as well as a recorded training session shall also be provided to the Owner.

ATTACHMENTS / REISSUED DRAWINGS:

- L000**
- L301**
- L600**
- L604**
- E011**
- E701**



Todd Slatin, Director
Division of Procurement

All other terms and conditions of the bid and specifications are unchanged. This letter should be signed, attached to and become a part of your submittal.

COMPANY NAME: _____

ADDRESS: _____

SIGNATURE OF BIDDER: _____



SIGN-IN SHEET

Pre-Bid Meeting #24-2024 Phoenix Park Reimagined Construction Project
April 23, 2024 @ 1:00 pm Picadome Administration Bldg. 469 Parkway Drive

Representative	Company Name	DBE/MBE/WBE/ Veteran	Phone#	Email Address
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IX. TECHNICAL SPECIFICATIONS

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SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
- C. Related Requirements:
 - 1. Refer to LFUCG General Conditions for additional requirements.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Landscape Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Landscape Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Owner from the designated suppliers.

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Landscape Architect under allowance and shall include taxes, freight and delivery to Project site and any other items specifically indicated in the Documents.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Landscape Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Landscape Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
 - 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Modular Restroom Building. Contractor shall include in their bid an Allowance of \$275,000 (two hundred seventy-five thousand dollars and zero cents) for the purchase and installation of one modular restroom building. The Owner will provide the successful bidder with a list of three modular restroom manufacturers that have been vetted and proven capable of providing the desired product within the project schedule. The manufacturer will provide a restroom building unit with one bathroom, one storage room and a mechanical chase included. The Allowance of \$250,000 includes the building, freight and installation. The Allowance of \$250,000 also includes installation of the concrete pad by the Contractor. Utilities to serve this modular building are shown in the Documents and shall be included in the base bid, separate from the Allowance. At the time final quotes are received during construction for selection and purchase of modular restroom building, the Allowance will be adjusted as required by final quote and scope at that time. Subparagraph below addresses relationship to unit prices.

END OF SECTION 01 2100

SECTION 03 3000 - CAST-IN-PLACE CONCRETE (LIMITED APPLICATIONS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes, for noncritical applications of concrete and for projects using small quantities of concrete.
- B. Related Sections include the following:
 - 1. Division 31 Section "Earth Moving" for earthwork and drainage fill under slabs-on-grade.
 - 2. Division 32 Section "Concrete Paving" for concrete pavement and walks.

1.3 SUBMITTALS

- A. General: In addition to the following, comply with submittal requirements in ACI 301.
- B. Product Data: For each type of product indicated.
- C. Design Mixtures: For each concrete mixture.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- C. Comply with ACI 301, "Specification for Structural Concrete," including the following sections, unless modified by requirements in the Contract Documents:
 - 1. "General Requirements."
 - 2. "Formwork and Formwork Accessories."
 - 3. "Reinforcement and Reinforcement Supports."
 - 4. "Concrete Mixtures."
 - 5. "Handling, Placing, and Constructing."
- D. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

PART 2 - PRODUCTS

2.1 FORMWORK

- A. Furnish formwork and formwork accessories according to ACI 301.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Wire: ASTM A 82, as drawn.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F.
- B. Normal-Weight Aggregate: ASTM C 33, graded, 1-1/2-inch nominal maximum aggregate size.
- C. Water: ASTM C 94/C 94M; potable.

2.4 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.5 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 CONCRETE MIXTURES

- A. Comply with ACI 301 requirements for concrete mixtures.
- B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:
 - 1. Minimum Compressive Strength: 3500 psi at 28 days.
 - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 - 3. Slump Limit: 4 inches, plus or minus 1 inch.
 - 4. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of floor slabs to receive troweled finishes to exceed 3 percent.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

3.2 STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.3 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Locate and install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Landscape Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
- D. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3.4 CONCRETE PLACEMENT

- A. Comply with ACI 301 for measuring, batching, mixing, transporting, and placing concrete.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
- C. Do not add water to concrete during delivery, at Project site, or during placement.
- D. Consolidate concrete with mechanical vibrating equipment.

3.5 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding 1/2 inch.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch.
 - 1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following rubbed finish, defined in ACI 301, to smooth-formed finished as-cast concrete where indicated:
 - 1. Smooth-rubbed finish.

- D. Board Form Finish: Use natural cedar board in varied widths of 4" and 6" in random patterns to provide board form finish at vertical faces of seat walls where indicated.
- E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.6 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
 - 1. Do not further disturb surfaces before starting finishing operations.
- C. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, fluid-applied or direct-to-deck-applied membrane roofing, or sand-bed terrazzo.
- D. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
- E. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.
- F. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.7 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:

1. **Moisture Curing:** Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
2. **Moisture-Retaining-Cover Curing:** Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. **Curing Compound:** Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
4. **Curing and Sealing Compound:** Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.8 FIELD QUALITY CONTROL

- A. **Testing Agency:** Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.
- B. **Tests:** Perform according to ACI 301.
 1. **Testing Frequency:** One composite sample shall be obtained for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

3.9 REPAIRS

- A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION 03 3000

SECTION 04 4300 – STONE MASONRY (FOR STONE FEATURES)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes natural stone veneer in the following applications:
 - 1. Stone features in landscape areas as indicated on drawings

1.3 SUBMITTALS

- A. Stone Samples for Verification.
- B. Installer Qualifications

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An installer who has completed work similar in material, design, and extent to those indicated for this Project and whose projects have a record of successful in-service performance.
- B. Source Limitations for Stone: Stone shall be limestone native to the Bluegrass region.
 - 1. Stone may be obtained from various sources, including native limestone salvaged from construction sites where native stone was removed to facilitate construction.
- D. Mockups: Build a mockup of the stacked stone assembly in landscape areas for review. Mockup to be a minimum 48"x48" and may be assembled in place to remain upon approval.
 - 1. Include full assembly of stones in setting bed of fines, with wet set base as indicated on Drawings.
 - 2. Include mockup for angled stones and flat stone pieces as indicated on Drawings.

2. Protect accepted mockups from the elements with weather-resistant membrane.
3. Approval of mockups is for color, texture, and blending of stone.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Landscape Architect in writing.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

PART 2 - PRODUCTS

2.1 STONE

- A. Native Kentucky limestone: Stone cuts, finishes and veneer shall be as indicated on the drawings.
- B. Pattern: Stone feature assemblies as indicated in drawings, shall also have dry-stacked appearance.
- C. Boulders and Slabs: Sound native stone free of shale and other deleterious materials in sizes as specified in the Drawings and approved by Architect.
- D. Stone may be obtained from various sources, including native limestone salvaged from construction activities where native stone was removed to facilitate construction activities. Stone shall be locally sourced from the Bluegrass region and conform with the general sizes and qualities also indicated on the Drawings.

2.2 MISCELLANEOUS MASONRY ACCESSORIES

- A. Cavity Drainage Stone: Washed gravel or washed crushed stone complying with ASTM C 33, Size No. 6.

2.3 STONE FABRICATION

- A. General: Provide stone in sizes and shapes necessary to comply with requirements indicated, including details on Drawings. Field cutting and dressing of stone as necessary to meet design intent is acceptable.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.
- B. Prepare surface by grading to subgrade elevations and installing setting course of stone as indicated.

3.2 SETTING OF STONE, GENERAL

- A. Perform necessary field cutting as stone is set. Use power saws to cut stone. Cut lines straight and true, with edges eased slightly to prevent snipping.
- B. Sort stone before it is placed to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or fabrication, or that is otherwise unsuitable for intended use.
- C. Arrange stones for good fit in roughly coursed pattern to create appearance of a dry laid stacked stone. Insert small stones into spaces between larger stones as needed to produce joints as uniform in width as practical.
- D. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance.
- E. Set stone to comply with requirements indicated on Drawings. Set stone accurately in locations indicated with edges and faces aligned according so that each arrangement of stone has the same orientation.
- F. Set stones to prevent gaps and openings between stones greater than ½"

3.3 ADJUSTING AND CLEANING

- A. Remove and replace stone veneer assemblies of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Landscape Architect.
 - 2. Stone assemblies not matching approved samples and mockups.
 - 4. Stone assemblies not complying with other requirements indicated.
- B. Replace in a manner that results in stone veneer assemblies' matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.
- C. In-Progress Cleaning: Clean stone assemblies as work progresses.

- D. Final Cleaning: After stones are set and cured, clean stone veneer assemblies as follows:
 - 1. Clean stone assemblies by bucket and brush hand-cleaning method described in BIA Technical Note No. 20 Revised II, using job-mixed detergent solution where any debris, dirt and stains may have occurred from constructin activities.

3.4 EXCESS MATERIALS AND WASTE

- A. Excess Masonry Waste: Remove excess clean masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 4300

SECTION 05 5214 – EXTERIOR PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Anodized aluminum pipe and tube guard railings.
 - 2. Stainless-steel pipe and tube railings.
- B. Related Sections include the following:
 - 1. Division 05 Section "Pipe and Tube Railings" for railings associated with interior stairs.

1.3 PERFORMANCE REQUIREMENTS

- A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
 - 1. Aluminum: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.
 - 2. Stainless Steel: 60 percent of minimum yield strength.
- B. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 3. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
 - b. Uniform load of 25 lbf/sq. ft. applied horizontally.
 - c. Infill load and other loads need not be assumed to act concurrently.

- C. Thermal Movements: Provide exterior railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of mechanically connected railings.
 - 2. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes on stainless steel.
- D. Samples for Verification: For each type of exposed finish required.
 - 1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
 - 2. Fittings and brackets.
 - 3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.
 - a. Show method of finishing and connecting members at intersections.
- E. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- F. Welding certificates.
- G. Qualification Data: For professional engineer and testing agency.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.
- B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.2, "Structural Welding Code--Aluminum."
2. AWS D1.6, "Structural Welding Code--Stainless Steel."

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating railings without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
 2. Provide allowance for trimming and fitting at site.

1.7 COORDINATION AND SCHEDULING

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Aluminum Pipe and Tube Railings:
 - a. AlumaGuard Corp.
 - b. ATR Technologies, Inc.
 - c. Blum, Julius & Co., Inc.
 - d. Braun, J. G., Company; a division of the Wagner Companies.
 - e. CraneVeyor Corp.
 - f. Hollaender Manufacturing Company.
 - g. Moultrie Manufacturing Company.
 - h. Pisor Industries, Inc.
 - i. Sterling Dula Architectural Products, Inc.
 - j. Superior Aluminum Products, Inc.
 - k. Thompson Fabricating, LLC.
 - l. Tubular Specialties Manufacturing, Inc.
 - m. Tuttle Aluminum & Bronze.
 - n. Wagner, R & B, Inc.; a division of the Wagner Companies.
 2. Stainless-Steel Pipe and Tube Railings:
 - a. Blum, Julius & Co., Inc.
 - b. Paragon Aquatics; Division of Pentair Pool Products, Inc.
 - c. Pisor Industries, Inc.

- d. Stainless Fabricators, Inc.
- e. Sterling Dula Architectural Products, Inc.
- f. Tubular Specialties Manufacturing, Inc.
- g. Tuttle Aluminum & Bronze.
- h. Wagner, R & B, Inc.; a division of the Wagner Companies.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.3 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
- B. Extruded Tubing: ASTM B 221, Alloy 6063-T5/T52.
- C. Extruded Structural Pipe and Round Tubing: ASTM B 429, Alloy 6063-T6.
 - 1. Provide Standard Weight (Schedule 40) pipe, unless otherwise indicated.
- D. Drawn Seamless Tubing: ASTM B 210, Alloy 6063-T832.
- E. Plate and Sheet: ASTM B 209, Alloy 6061-T6.
- F. Die and Hand Forgings: ASTM B 247, Alloy 6061-T6.
- G. Castings: ASTM B 26/B 26M, Alloy A356.0-T6.
- H. Woven-Wire Mesh: Intermediate-crimp, square pattern, 2-inch woven-wire mesh, made from 0.162-inch nominal diameter wire complying with ASTM B 211, Alloy 6061-T94.

2.4 316 STAINLESS STEEL

- A. Tubing: ASTM A 554, Grade MT 304.
- B. Pipe: ASTM A 312/A 312M, Grade TP 304.
- C. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.
- D. Plate and Sheet: ASTM A 666, Type 304.

2.5 FASTENERS

- A. General: Provide the following:

1. Aluminum Railings: Type 304 stainless-steel fasteners.
 2. Stainless-Steel Railings: Type 304 stainless-steel fasteners.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
 2. Provide tamper-resistant flat-head machine screws for exposed fasteners, unless otherwise indicated.
- D. Anchors: Provide chemical anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

2.6 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
1. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior applications.

2.7 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

- G. Connections: Fabricate railings with welded connections, unless otherwise indicated.
 - H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
 - I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.
 - J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
 - K. Form changes in direction as follows:
 - 1. By bending or by inserting prefabricated elbow fittings.
 - L. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
 - M. Close exposed ends of railing members with prefabricated end fittings.
 - N. Brackets, Flanges, Fittings, and Anchors: Provide brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.
 - O. Woven-Wire Mesh Infill Panels: Fabricate infill panels from woven-wire mesh crimped into 1-by-1/2-by-1/8-inch metal channel frames. Make wire mesh and frames from same metal as railings in which they are installed.
 - 1. Orient wire mesh with wires perpendicular and parallel to top rail.
- 2.8 FINISHES, GENERAL
- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
 - C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are

acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

2.9 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

2.10 STAINLESS-STEEL FINISHES

- A. Remove tool and die marks and stretch lines or blend into finish.
- B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- C. Directional Satin Finish: No. 4.
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 "Fabrication" Article whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches of post.

3.3 ANCHORING POSTS

- A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Cover anchorage joint with flange of same metal as post, attached to post with set screws.

3.4 ADJUSTING AND CLEANING

- A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

3.5 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 5214

SECTION 13 0000 – FOG SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Fog system including pump unit, distribution line, hose and tube fittings, atomization line, valves, nozzles, and related accessories and specialties as hereinafter described or shown on the Drawings.
2. Water treatment system including reverse osmosis system, water softener system, ultra-violet sterilizer, valves, piping, and related accessories.
3. Mounting elements and mechanical fasteners for suspension and support of components, piping, and equipment.

1.2 SUBSTITUTIONS

A. The use of manufacturers' names and catalog numbers followed by the phrase "or approved equal" is generally used to establish a standard of quality and utility for the specified items and to provide a dimensional reference for construction documents that are drawn to scale.

B. Submittals for "approved equal" items shall, where applicable, include the following data which are not necessarily required for specified items:

1. Manufacturer's shop drawings or catalog pages.
2. Performance characteristics.
3. Materials.
4. Finish.
5. Certification of conformance with specified codes and standard specifications.

C. Submittals of "approved equal" components may be rejected if:

1. Manufacturer's shop drawings or catalog pages are not included.
2. The component would necessitate the alteration of any portion of the plumbing, electrical, architectural, or structural design.
3. Dimensions vary from the specified component in such a manner that accessibility or clearances are impaired or the work of other trades is adversely affected.

1.3 SUBMITTALS

A. Product data: Submit dimensional drawings and/or product data from manufacturer for the following items furnished under this Section:

1. Pump unit.
2. Distribution line.
3. Atomization line.
4. Hose and tube fittings.
5. Nozzles.
6. Valves.
7. Reverse osmosis system.
8. Water softener system.
9. Ultra-violet sterilization.
10. Mounting elements and mechanical fasteners.
11. Specialties.
12. Related accessories.

- B. Shop Drawings: Provide shop drawings of the following:
 - 1. Equipment space layout showing all plumbing, equipment, and piping.
 - 2. Complete Fog layout showing locations for all piping, components, and mounting elements, including components that are not included within this section. All piping, components, and mounting elements shall be dimensionally accurate.
- C. Operation and Maintenance Data: Provide operating instruction of the system including methods of starting and stopping the system and checking the system for normal operation. Provide maintenance instructions that include a recommended preventative maintenance schedule and spare parts list.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Products shown on the Drawings but not specified herein shall be provided in accordance with information shown on the Drawings and the general provisions of this part of the Specification.

2.2 FOG SYSTEM

- A. Basis of Design Fog System is by Koolfog, Inc. Subject to requirements indicated in the Documents, Contractor may also supply and install a complete fog system with all components and final engineering and design provided by a single manufacturer; additional approved manufacturer's are Roman Fountains and Tecno Cooling. All components of the system shall be provided by a single manufacturer. Individual Basis of Design components are listed hereing in Part 2 Products; alternate Manufacturers shall be required to supply equipment of the same quality and performance.
- B. High-pressure pump unit:
 - 1. Basis of Design is the Atacama VFD series high-pressure pumps as manufactured by Koolfog, Inc.
 - a. Cat. No. as listed below and as shown in the Drawings.
 - i. A5.0VFD.
 - b. Belt-drive triplex plunger pump.
 - c. Premium efficiency motor.
 - d. Controls:
 - i. Variable frequency drive advanced controls.
 - 1. Hand/Off/Auto operating modes.
 - 2. Constant pressure variable flow operation:
 - a. Remote Start/Stop control: (1) Maintained voltage-free contact closure input.
 - b. Remote pressure selection for four pressure settings: (2) Maintained voltage-free contact closure input.
 - 3. Variable pressure operation:
 - a. Remote Start/Stop control and pressure selection: (1) 0-10V analog input.

e. Diagnostics:

- i. Inlet and outlet glycerin filled gauges on filtration assembly.
- ii. High pressure glycerin filled gauge on discharge.
- iii. Hour meter usage indicator.
- iv. Run status.
- v. Fault status.
- vi. Service status.

f. Protection:

- i. Low inlet water pressure protection.
- ii. Low/high outlet pressure protection.
- iii. Safety relief valve.
- iv. Pressure release drain.
- v. Thermal relief valve.
- vi. Pulsation dampener.
- vii. Motor thermal overload.
- viii. Dual stage filtration, scale inhibiting in second position.
- ix. NEMA enclosure.

C. High-pressure distribution line:

Stainless steel distribution line:

- a. As manufactured by Koolfog, Inc.
 - i. Cat. No. SSM0008-316.
- b. Material: Stainless steel 316.
- c. Dual-certified ASTM A269 and ASTM/ASME A/SA249.

2. High-pressure flexible distribution line:

- a. As manufactured by Koolfog, Inc.
- b. Tube: Polyester Elastomer
- c. Reinforcement: Single Polyester Braid
- d. Cover: Polyurethane
- e. Cover Color: Black, Perforated
- f. Temperature Range: -40°F to +212°F
- g. Working Length: ±2% @ rated WPSI
 - i. Cat. No. HPH0008.
 1. Maximum Working Pressure: 2,000 PSI
 2. Minimum Burst Pressure: 8,000 PSI
 3. Nominal I.D.: 1/2"
 4. Maximum O.D.: .810"
 5. Minimum Bend Radius: 3"
 6. Weight: 14.8lbs. per 100'

D. Fog Fixtures:

1. Ring Light Fog Jet:

- a. As supplied by Koolfog, Inc.
 - i. Cat. No. RLFJ.

- b. Material: 316 stainless steel welded tubing, 1/2" OD, .035" wall.
- c. Core, mounting bracket and cover.
- d. Cover designed for optimized fog.
- e. Integrated mounting points to Crystal Fountains Ring Lights.
- f. 5' stainless steel braided high pressure hose included.

E. Fog Nozzles

- 1. J-pin nozzle 316:
 - a. As manufactured by Koolfog, Inc.
 - i. Cat. No. KFNPJHP-316.
 - b. Material: 316 stainless steel.
 - c. Impingement pin type: J-pin style.
 - d. Thread: 1/8 NPT.

F. Hose and tube fittings:

- 1. Compression fittings:
 - a. As supplied by Koolfog, Inc.
 - b. Material: 316 stainless steel.
 - c. Connection: Tube-to-Tube, Tube-to-NPT.
 - d. Two-ferrule design.
- 2. Reusable hose fittings:
 - a. As supplied by Koolfog, Inc.
 - b. Material: Brass.
 - c. Connection: Hose-to-NPT.
 - d. High pressure rating.
 - e. Field Installable.

G. Valves:

- 1. Solenoid Valves:
 - a. As supplied by Koolfog, Inc.
 - i. Cat. No. ZSV-24V.
 - b. Normally closed operation.
 - c. Material: Brass body, stainless steel components.
 - d. 3/8" FNPT ports.
 - e. 1200 PSI.
 - f. Voltages as listed in Cat. No.

2.3 WATER TREATMENT SYSTEM

A. Complete water treatment system:

- 1. Complete water treatment system package for Atacama A5.0VFD-400:
 - a. As supplied by Koolfog, Inc.

- b. Cat. No. KFRO-0324
- c. Reverse Osmosis included
- d. Pre-treatment included as specified in package
- e. UV included

2.4 MOUNTING ELEMENTS AND MECHANICAL FASTENERS

A. Mounting element:

- 2. Loop clamp
 - a. As supplied by Koolfog, Inc.
 - b. Cat. No. LC08.
 - c. Material: 316 stainless steel.
 - d. Construction: Neoprene cushioned for vibration and noise dampening.

PART 3- EXECUTION

3.1 FOG SYSTEM

A. High-pressure pump units:

- 1. Install and connect equipment in accordance with manufacturers' instructions and recommendations.
- 2. Before pumps are operated, ensure the water treatment system is fully operational, purged of air, and all isolation valves servicing the pumps are fully opened.
- 3. Provide drain piping as needed and extend to nearest drain.

B. High-pressure distribution line:

- 1. Protect all openings in the distribution line during construction to prevent entrance of foreign matter.
- 2. Flexible high-pressure distribution lines shall be completely lubricated when pulled through conduit. Lubricant shall be applied immediately before and during the pull.
- 3. Do not bend flexible high-pressure distribution lines during installation, either permanently or temporarily, to radii less than 5 times the outer diameters.
- 4. Cut stainless steel distribution line to measurements established at the site. Work into place without springing or forcing.
- 5. Install stainless steel distribution line straight and true to bear evenly on supports.
- 6. Supports for stainless steel distribution line shall not exceed 4' spacing.
- 7. Slope piping and arrange system to drain at low points.
- 8. Maintain clearance for access to valves and fittings. Install valves with stems upright or horizontal.
- 9. Flush distribution lines to remove foreign matter prior to commissioning.

C. Atomization line:

- 1. Protect all openings in the distribution line during construction to prevent entrance of foreign matter.
- 2. Cut atomization line to measurements established at the site. Work into place without springing or forcing.
- 3. Install atomization line straight and true to bear evenly on supports.
- 4. Supports for atomization line shall not exceed 3' spacing.

5. Slope piping and arrange system to drain at low points.
6. Maintain clearance for access to valves and fittings. Install valves with stems upright or horizontal.
7. Flush atomization line to remove foreign matter prior to commissioning.

D. Commissioning:

1. Flushing:

- a. All distribution lines and atomization lines shall be flushed of foreign matter with water, pumped from the high-pressure pump, for a duration of 10 minutes.
- b. Once all distribution lines and atomization lines are flushed, then nozzles shall be installed on atomization line.

2. Pressure testing:

- a. All distribution lines and atomization lines shall be pressure tested at a pressure of 1000 PSI, using water pressure from the high-pressure pumps, for a duration of 10 minutes.
- b. Replace or repair any part that leaks. Repeat test until criteria are met.

3. Startup:

- a. The high-pressure pumps shall be set to normal operating pressure.
- b. The system shall operate fully automated and uninterrupted for a duration of 1 hour.
- c. Replace or repair any part that does not conform. Repeat test until criteria are met.

3.2 WATER TREATMENT SYSTEM

A. Complete water treatment system:

1. Install and connect equipment in accordance with manufacturers' instructions and recommendations.
2. Provide drain piping as needed and extend to nearest drain.

B. Ultra-violet sterilizer:

1. Install and connect equipment in accordance with manufacturers' instructions and recommendations.
2. A 3-valve bypass assembly shall be employed for the system.

C. Piping:

1. General:

- a. Protect all openings in piping during construction to prevent entrance of foreign matter.
- b. Cut pipe to measurements established at the site. Work into place without springing or forcing.
- c. Cut pipe and tubing ends square. Remove rough edges and burrs so that a smooth and unobstructed flow will be obtained.

2. Pipe joints:

a. Soldered joints:

- (1) Use drawn temper tubing.
- (2) Clean surfaces to be jointed of oil, grease, rust and oxides. After cleaning and before assembly or heating, apply an appropriate flux to each joint surface and spread evenly. Apply heat with an oxyacetylene torch.
- (3) Make up all joints using non-corrosive flux and 95-5 solder, ASTM B32 Grade A.
- (4) Provide each valve with two C x MIPS adapter ground joint unions.
- (5) Provide dielectric unions at points of connection to ferrous piping.

b. Threaded joints:

- (1) Make up joints with Teflon tape.
- (2) Where screwed connections are used in copper systems, all nipples shall be standard weight red brass.

3.3 PROVISIONING

A. Underground conduit:

1. Electrical PVC conduit, Schedule 40 shall be used as conduit for underground routing of high-pressure flexible distribution line.
2. Radius elbow fittings shall have a radius of no less than 18".
3. Bends not of radius elbow fittings shall have a minimum bend radius of no less than 18".
4. No more than 360° of bends from opening to opening of a conduit run. All PVC bends shall be Schedule 80.
5. Conduit shall be installed in accordance of ASTM F512.
6. Size conduit as listed below:

High-pressure flexible distribution line	Conduit Size	Maximum Run
Cat. No. HPH0008	2" PVC Conduit, Schedule 40	200' maximum recommended run, use access box if exceeding 200' note: always verify pressure losses before sizing runs

END OF SECTION 13 0000

SECTION 221113 – FACILITY WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes water-distribution piping and related components outside the building for water service and fire-service mains.
- B. Utility-furnished products include water meters that will be furnished to the site, ready for installation.

1.3 DEFINITIONS

- A. PVC: Polyvinyl chloride plastic.
- B. DIP: Ductile Iron Pipe
- C. HDPE: High Density Polyethylene Pipe

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Detail precast concrete vault assemblies and indicate dimensions, method of field assembly, and components. Retain subparagraph below if equipment includes wiring.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: For piping and specialties including relation to other services in same area, drawn to scale. Show piping and specialty sizes and valves, meter and specialty locations, and elevations.
- B. Field quality-control test reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For water valves and specialties to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
3. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
4. Comply with Ten States Standards, Latest Edition for Potable Water Distribution.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.

D. Comply with FMG's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.

E. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.

F. NSF Compliance:

1. Comply with NSF 14 for plastic potable-water-service piping. Include marking "NSF-pw" on piping.
2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare valves, including fire hydrants, according to the following:

1. Ensure that valves are dry and internally protected against rust and corrosion.
2. Protect valves against damage to threaded ends and flange faces.
3. Set valves in best position for handling. Set valves closed to prevent rattling.

B. During Storage: Use precautions for valves, including fire hydrants, according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew-point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

C. Handling: Use sling to handle valves and fire hydrants if size requires handling by crane or lift. Rig valves to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.

E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.

- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.9 PROJECT CONDITIONS

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:
 - 1. Notify Architect no fewer than 10 days in advance of proposed interruption of service.
 - 2. Do not proceed with interruption of water-distribution service without Architect written permission.

1.10 COORDINATION

- A. Coordinate connection to water main with utility owner and operator.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

- A. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
 - 1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
 - 2. Copper, Pressure-Seal Fittings:
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Viega; Plumbing & Heating Systems.
 - b. NPS 2 and Smaller: Wrought-copper fitting with EPDM O-ring seal in each end.
 - c. NPS 2-1/2 to NPS 4 : Bronze fitting with stainless-steel grip ring and EPDM O-ring seal in each end.
- B. Hard Copper Tube: ASTM B 88, Type K, water tube, drawn temper.
 - 1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
 - 2. Copper, Pressure-Seal Fittings:
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Viega; Plumbing & Heating Systems.

- b. NPS 2 and Smaller: Wrought-copper fitting with EPDM O-ring seal in each end.
 - c. NPS 2-1/2 to NPS 4 Bronze fitting with stainless-steel grip ring and EPDM O-ring seal in each end.
- C. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
- D. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

2.2 DUCTILE-IRON PIPE AND FITTINGS

- A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated. Pipe shall be coated with a bituminous coating in accordance with ANSI/AWWA C151/A21.51. Interior shall be cement mortar lines and seal coated in compliance with the latest Rev. of ANSI/AWWA C104/A21.4. The cement mortar lining shall be double thickness.
- 1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 - 2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
 - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1) Anvil International, Inc.
 - 2) Victaulic Company of America.
- B. Flanges: ASME 16.1, Class 250, cast iron.

2.3 PVC PIPE AND FITTINGS

- A. Pipe
- B. PVC (ASTM) pipe shall be furnished as SDR 26, 21, and 17 for Class 160-psi, 200-psi and 250-psi respectively.
- C. PVC, AWWA Pipe: AWWA C900, Class 200, with bell end with gasket, and with spigot end.
- 1. Comply with UL 1285 for fire-service mains if indicated.
 - 2. PVC Fabricated Fittings: AWWA C900, Class 200, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
 - 3. PVC Molded Fittings: AWWA C907, Class 200, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
 - 4. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 - a. Gaskets: AWWA C111, rubber.
 - 5. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.

- a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- b. All mechanical joint fittings where thrust blocking is required will also be secure by joint restrain glands.
6. The use of solvent Cement connections is not allowed.

2.4 SPECIAL PIPE FITTINGS

A. Ductile-Iron Rigid Expansion Joints:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. EBAA Iron, Inc.
 - b. U.S. Pipe and Foundry Company.
3. Description: Three-piece, ductile-iron assembly consisting of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Select and assemble components for expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
 - a. Pressure Rating: 250 psig minimum.

B. Ductile-Iron Flexible Expansion Joints:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. EBAA Iron, Inc.
 - b. Hays Fluid Controls; a division of ROMAC Industries Inc.
 - c. Star Pipe Products.
2. Description: Compound, ductile-iron fitting with combination of flanged and mechanical-joint ends complying with AWWA C110 or AWWA C153. Include two gasketed ball-joint sections and one or more gasketed sleeve sections. Assemble components for offset and expansion indicated. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.
 - a. Pressure Rating: 250 psig minimum.

C. Ductile-Iron Deflection Fittings:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. EBAA Iron, Inc.

2. Description: Compound, ductile-iron coupling fitting with sleeve and 1 or 2 flexing sections for up to 15-degree deflection, gaskets, and restrained-joint ends complying with AWWA C110 or AWWA C153. Include AWWA C111, ductile-iron glands, rubber gaskets, and steel bolts.

- a. Pressure Rating: 250 psig minimum.

2.5 HDPE PIPE AND FITTINGS

A. PIPE

1. HIGH DENSITY POLYETHYLENE PIPE: The Pipe shall be equal to Chevron Phillips Performance Pipe 4200 Series and shall be supplied in class DR-11
2. Pipe shall be manufactured from a PE 3408 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The resin material shall meet the specifications of ASTM D3350-99 with a minimum cell classification of PE345464C. Pipe shall have a manufacturing standard of ASTM D3035 and be manufactured by an ISO 9001 certified manufacturer. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, voids, or other injurious defects.
3. PEX type pipe shall be PEX type A.

B. Fittings

1. BUTT FUSION FITTINGS: Butt fusion fittings shall be in accordance with ASTM D3261 and shall be manufactured by injection molding, a combination of extrusion and machining, or fabricated from HDPE pipe conforming to this specification. All fittings shall be pressure rated to provide a working pressure rating no less than that of the pipe. Fabricated fittings shall be manufactured using a McElroy Datalogger to record fusion pressure and temperature. A graphic representation of the temperature and pressure data for all fusion joints made producing fittings shall be maintained as part of the quality control. The fitting shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, voids, or other injurious defects.
2. ELECTROFUSION FITTINGS: Electrofusion Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99 and be the same base resin as the pipe. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055.

C. JOINING MATERIALS

1. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
2. Join with steel bands. Crimp stile fittings are not permitted.

2.6 PIPING SPECIALTIES

- A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.

B. Tubular-Sleeve Pipe Couplings:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cascade Waterworks Manufacturing.
 - b. Dresser, Inc.; Dresser Piping Specialties.
 - c. Ford Meter Box Company, Inc. (The); Pipe Products Div.
 - d. Hays Fluid Controls; a division of ROMAC Industries Inc.
 - e. JCM Industries.
 - f. Smith-Blair, Inc.
 - g. Viking Johnson.
2. Description: Metal, bolted, sleeve-type, reducing or transition coupling, with center sleeve, gaskets, end rings, and bolt fasteners and with ends of same sizes as piping to be joined.
 - a. Standard: AWWA C219.
 - b. Center-Sleeve Material: Stainless steel
 - c. Gasket Material: Natural or synthetic rubber.
 - d. Pressure Rating: 200 psig minimum.
 - e. Metal Component Finish: Corrosion-resistant coating or material.

C. Split-Sleeve Pipe Couplings:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Victaulic Depend-O-Lok.
2. Description: Metal, bolted, split-sleeve-type, reducing or transition coupling with sealing pad and closure plates, O-ring gaskets, and bolt fasteners.
 - a. Standard: AWWA C219.
 - b. Sleeve Material: Stainless steel.
 - c. Sleeve Dimensions: Of thickness and width required to provide pressure rating.
 - d. Gasket Material: O-rings made of EPDM rubber, unless otherwise indicated.
 - e. Pressure Rating: 200 psig minimum.
 - f. Metal Component Finish: Corrosion-resistant coating or material.

2.7 CORROSION-PROTECTION PIPING ENCASEMENT

A. Encasement for Underground Metal Piping:

1. Standards: ASTM A 674 or AWWA C105.
2. Form: Sheet
3. Material: High-density, crosslaminated PE film of 0.004-inch (0.10-mm) minimum thickness.
4. Color: Natural

2.8 GATE VALVES

A. AWWA, Cast-Iron Gate Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. American AVK Co.; Valves & Fittings Div.
- b. American Cast Iron Pipe Co.; American Flow Control Div.
- c. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
- d. Crane Co.; Crane Valve Group; Stockham Div.
- e. East Jordan Iron Works, Inc.
- f. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
- g. McWane, Inc.; Kennedy Valve Div.
- h. McWane, Inc.; M & H Valve Company Div.
- i. McWane, Inc.; Tyler Pipe Div.; Utilities Div.
- j. Mueller Co.; Water Products Div.
- k. NIBCO INC.
- l. U.S. Pipe and Foundry Company.

2. Nonrising-Stem, Resilient-Seated Gate Valves:

a. Description: Gray- or ductile-iron body and bonnet; with bronze or gray- or ductile-iron gate, resilient seats, bronze stem, and stem nut.

- 1) Standard: AWWA C509.
- 2) Minimum Pressure Rating: 250 psig .
- 3) End Connections: Mechanical joint.
- 4) Interior Coating: Complying with AWWA C550.

3. OS&Y, Rising-Stem, Resilient-Seated Gate Valves:

a. Description: Cast- or ductile-iron body and bonnet, with bronze or gray- or ductile-iron gate, resilient seats, and bronze stem.

- 1) Standard: AWWA C509.
- 2) Minimum Pressure Rating: 250 psig .
- 3) End Connections: Flanged.

B. UL/FMG, Cast-Iron Gate Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. American Cast Iron Pipe Co.; American Flow Control Div.
- b. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
- c. Crane Co.; Crane Valve Group; Stockham Div.
- d. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
- e. McWane, Inc.; Kennedy Valve Div.
- f. McWane, Inc.; M & H Valve Company Div.
- g. Mueller Co.; Water Products Div.
- h. NIBCO INC.
- i. U.S. Pipe and Foundry Company.

2. UL/FMG, Nonrising-Stem Gate Valves:
 - a. Description: Iron body and bonnet with flange for indicator post, bronze seating material, and inside screw.
 - 1) Standards: UL 262 and FMG approved.
 - 2) Minimum Pressure Rating: 250 psig.
 - 3) End Connections: Flanged.
 3. OS&Y, Rising-Stem Gate Valves:
 - a. Description: Iron body and bonnet and bronze seating material.
 - 1) Standards: UL 262 and FMG approved.
 - 2) Minimum Pressure Rating: 250 psig.
 - 3) End Connections: Flanged.
- C. Bronze Gate Valves:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Crane Co.; Crane Valve Group; Crane Valves.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Crane Co.; Crane Valve Group; Stockham Div.
 - d. Hammond Valve.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Red-White Valve Corporation.

2.9 GATE VALVE ACCESSORIES AND SPECIALTIES

- A. Tapping-Sleeve Assemblies:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
 - b. East Jordan Iron Works, Inc.
 - c. Flowserve.
 - d. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
 - e. McWane, Inc.; Kennedy Valve Div.
 - f. McWane, Inc.; M & H Valve Company Div.
 - g. Mueller Co.; Water Products Div.
 - h. U.S. Pipe and Foundry Company.
 2. Description: Sleeve and valve compatible with drilling machine.
 - a. Standard: MSS SP-60.
 - b. Tapping Sleeve: Cast- or ductile-iron or stainless-steel, two-piece bolted sleeve with flanged outlet for new branch connection. Include sleeve matching size and type of pipe material being tapped and with recessed flange for branch valve.

- c. Valve: AWWA, cast-iron, nonrising-stem, resilient-seated gate valve with one raised face flange mating tapping-sleeve flange.
- B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter. Valve Box shall comply with KAW requirements.
 1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.
- C. Indicator Posts: UL 789, FMG-approved, vertical-type, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve.

2.10 CHECK VALVES

A. AWWA Check Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American AVK Co.; Valves & Fittings Div.
 - b. American Cast Iron Pipe Co.; American Flow Control Div.
 - c. APCO Willamette; Valve and Primer Corporation.
 - d. Crane Co.; Crane Valve Group; Crane Valves.
 - e. Crane Co.; Crane Valve Group; Stockham Div.
 - f. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
 - g. McWane, Inc.; Kennedy Valve Div.
 - h. McWane, Inc.; M & H Valve Company Div.
 - i. Mueller Co.; Water Products Div.
 - j. NIBCO INC.
 - k. Watts Water Technologies, Inc.
2. Description: Swing-check type with resilient seat. Include interior coating according to AWWA C550 and ends to match piping.
 - a. Standard: AWWA C508.
 - b. Pressure Rating: 250 psig

B. UL/FMG, Check Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
 - b. Crane Co.; Crane Valve Group; Stockham Div.
 - c. Globe Fire Sprinkler Corporation.
 - d. Kidde Fire Fighting.
 - e. MATCO-NORCA, Inc.
 - f. McWane, Inc.; Clow Valve Co. Div. (Oskaloosa).
 - g. McWane, Inc.; Kennedy Valve Div.
 - h. Mueller Co.; Water Products Div.

- i. NIBCO INC.
 - j. Reliable Automatic Sprinkler Co., Inc.
 - k. Tyco Fire & Building Products.
 - l. United Brass Works, Inc.
 - m. Victaulic Company of America.
 - n. Viking Corporation.
 - o. Watts Water Technologies, Inc.
2. Description: Swing-check type with pressure rating; rubber-face checks, unless otherwise indicated; and ends matching piping.
- a. Standards: UL 312 and FMG approved.
 - b. Pressure Rating: 250 psig

2.11 DETECTOR CHECK VALVES

A. Detector Check Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Ames Fire & Waterworks; a division of Watts Regulator Co.
 - b. Badger Meter, Inc.
 - c. FEBCO; SPX Valves & Controls.
 - d. Globe Fire Sprinkler Corporation.
 - e. McWane, Inc.; Kennedy Valve Div.
 - f. Mueller Co.; Hersey Meters.
 - g. Victaulic Company of America.
 - h. Viking Corporation.
 - i. Watts Water Technologies, Inc.
2. Description: Galvanized cast-iron body, bolted cover with air-bleed device for access to internal parts, and flanged ends. Include one-piece bronze disc with bronze bushings, pivot, and replaceable seat. Include threaded bypass taps in inlet and outlet for bypass meter connection. Set valve to allow minimal water flow through bypass meter when major water flow is required.
 - a. Standards: UL 312 and FMG approved.
 - b. Pressure Rating: 250 psig
 - c. Water Meter: AWWA C700, disc type, at least one-fourth size of detector check valve. Include meter, bypass piping, gate valves, check valve, and connections to detector check valve.
3. Description: Iron body, corrosion-resistant clapper ring and seat ring material, flanged ends, with connections for bypass and installation of water meter.
 - a. Standards: UL 312 and FMG approved.
 - b. Pressure Rating: 250 psig.

2.12 CORPORATION VALVES

2.13 Manufacturers:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Amcast Industrial Corporation; Lee Brass Co.
 - b. Ford Meter Box Company, Inc. (The); Pipe Products Div.
 - c. Jones, James Company.
 - d. Master Meter, Inc.
 - e. McDonald, A. Y. Mfg. Co.
 - f. Mueller Co.; Water Products Div.
 - g. Red Hed Manufacturing & Supply.
- B. Service-Saddle Assemblies: Comply with AWWA C800. Include saddle and valve compatible with tapping machine.
 1. Service Saddle: Copper alloy with seal and AWWA C800, threaded outlet for corporation valve.
 2. Corporation Valve: Bronze body and ground-key plug, with AWWA C800, threaded inlet and outlet matching service piping material.
 3. Manifold: Copper fitting with two to four inlets as required, with ends matching corporation valves and outlet matching service piping material.
- C. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.
- D. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over curb valve and with a barrel approximately 3 inches in diameter.
 1. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

2.14 WATER METERS

- A. Water meters will be furnished by Kentucky American Water, unless noted otherwise.

2.15 BACKFLOW PREVENTERS

- A. Double-Check, Backflow-Prevention Assemblies:
 1. Refer to Drawings.
 2. Description: Factory calibrated, with gages, fittings, hoses, and carrying case with test-procedure instructions.

2.16 WATER METER BOXES

- A. Description: Cast-iron body and cover for disc-type water meter, with lettering "WATER METER" in cover; and with slotted, open-bottom base section of length to fit over service piping.
 - a.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Refer to Section 02300 "Earth moving" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
- C. Do not use flanges or unions for underground piping.
- D. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- E. Underground water-service piping NPS 3/4 to NPS 3 shall be any of the following:
 - 1. Soft copper tube, ASTM B 88, Type K copper, pressure-seal fittings; and pressure-sealed joints.
 - 2. PVC, Schedule 40 pipe; PVC, Schedule 80 socket fittings; and solvent-cemented joints.
 - 3. Soft copper tube, [ASTM B 88, Type K (ASTM B 88M, Type A)] [ASTM B 88, Type L (ASTM B 88M, Type B)]; wrought-copper, solder-joint fittings; and brazed joints.
 - 4. Ductile-iron, [push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed] [mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical] [grooved-end pipe; ductile-iron-pipe appurtenances; and grooved] joints.
 - 5. PE, AWWA pipe; PE, AWWA fittings; and heat-fusion joints.
 - 6. PVC, Schedule [40 pipe; PVC, Schedule 40] [80 pipe; PVC, Schedule 80] socket fittings; and solvent-cemented joints.
- F. Aboveground and Vault Water-Service Piping NPS 3/4 to NPS 3 shall be any of the following:
 - 1. Hard copper tube, ASTM B 88, Type K wrought-copper, solder-joint fittings; and brazed joints.
- G. Aboveground and vault water-service piping NPS 4 to NPS 8 shall be any of the following:
 - 1. Hard copper tube, [ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
 - 2. Ductile-iron, grooved-end pipe; ductile-iron, grooved-end appurtenances; and grooved joints.

- H. Underground Fire-Service-Main Piping NPS 4 to NPS 12 shall be any of the following:
 - 1. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed mechanical-joint pipe; ductile-iron, mechanical-joint grooved joints.
 - 2. PVC, AWWA Class 200 pipe listed for fire-protection service; PVC Class 200 fabricated fittings; and gasketed joints.
 - 3. Fire service connections and fire hydrants shall have diameters and thread matching KAWC standards.
 - 4. Fire service connections shall be installed with a metal sign, with one inch raised letters.
- I. Aboveground and Vault Fire-Service-Main Piping NPS 4 to NPS 12 shall be ductile-iron, grooved-end pipe; ductile-iron-pipe appurtenances; and grooved joints.

3.3 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for NPS 3 (DN 80) and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FMG, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 (DN 50) and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 - 1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, metal resilient-seated gate valves with valve box.
 - 2. Underground Valves, NPS 4 and Larger, for Indicator Posts: UL/FMG, cast-iron, nonrising-stem gate valves with indicator post.
 - 3. Use the following for valves in vaults and aboveground:
 - a. Gate Valves, NPS 2 and Smaller: Bronze, nonrising rising stem.
 - b. Check Valves: AWWA C508 UL/FMG, swing type.

3.4 PIPING INSTALLATION

- A. Water-Main Connection: Arrange with utility company for tap of size and in location indicated in water main. All fittings may not be shown for clarity. It is the contractor's responsibility to include all necessary fittings in their bid. Unless otherwise noted. Bends shall be 45 degrees.
 - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
 - 2. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- B. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.
 - 1. Install PE corrosion-protection encasement according to ASTM A 674 or AWWA C105.
- C. Install PVC, AWWA pipe according to ASTM F 645 and AWWA M23.
- D. HDPE pipe shall be installed per the manufacturer recommendation and AWWA C901.
- E. Bury piping with depth of cover over top at least 30 inches , with top at least 12 inches below level of maximum frost penetration, and according to the following:
 - 1. Under Driveways: With at least 36 inches cover over top.

2. In Loose Gravelly Soil and Rock: With at least 12 inches additional bedding.
- F. Install piping by tunneling or jacking, or combination of both, under streets and other obstructions that cannot be disturbed.
- G. Extend water-service piping and connect to water-supply source and building-water-piping systems at outside face of building wall in locations and pipe sizes indicated.
 1. Terminate water-service piping at building wall until building-water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building-water-piping systems when those systems are installed.
- H. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.
- I. See Section 15140 "Domestic Water Piping" for potable-water piping inside the building.

3.5 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
 1. Copper-Tubing, Pressure-Sealed Joints: Use proprietary crimping tool and procedure recommended by copper, pressure-seal-fitting manufacturer.
 2. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
 3. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
 4. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
 5. HDPE Pipe Joining
 - a. BUTT FUSION: Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself.
 - b. SIDEWALL FUSION: Sidewall fusions for connections to outlet piping shall be performed in accordance with HDPE pipe and fitting manufacturer's specifications. The heating irons used for sidewall fusion shall have an inside diameter equal to the outside diameter of the HDPE pipe being fused. The size of the heating iron shall be ¼ inch larger than the size of the outlet branch being fused.

3.6 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:

1. Concrete thrust blocks.
 2. Locking mechanical joints.
 3. Set-screw mechanical retainer glands.
 4. Bolted flanged joints.
 5. Heat-fused joints.
 6. Pipe clamps and tie rods.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
 2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
- C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.7 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. AWWA Valves Other Than Gate Valves: Comply with AWWA C600 and AWWA M44.
- C. UL/FMG, Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.
- D. UL/FMG, Valves Other Than Gate Valves: Comply with NFPA 24.
- E. MSS Valves: Install as component of connected piping system.
- F. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

3.8 DETECTOR-CHECK VALVE INSTALLATION

- A. Install in vault.
- B. Install for proper direction of flow. Install bypass with water meter, gate valves on each side of meter, and check valve downstream from meter.
- C. Support detector check valves, meters, shutoff valves, and piping per plans and in accordance with KAW requirements.

3.9 WATER METER INSTALLATION

- A. Install water meters, piping, and specialties according to utility company's written instructions.

3.10 ROUGHING-IN FOR WATER METERS

- A. Rough-in piping and specialties for water meter installation according to utility company's written instructions.

3.11 VACUUM BREAKER ASSEMBLY INSTALLATION

- A. Install pressure vacuum breaker assemblies of type, size, and capacity indicated. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.

3.12 BACKFLOW PREVENTER INSTALLATION

- A. Install backflow preventers of type, size, and capacity indicated. Refer to MEP plans. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.
- B. Support NPS 2-1/2 and larger backflow preventers, valves, and piping near floor and on brick or concrete piers.

3.13 WATER METER BOX INSTALLATION

- A. Install water meter boxes in paved areas flush with surface.
- B. Install water meter boxes in grass or earth areas with top 1/2 inches above surface.

3.14 CONCRETE VAULT INSTALLATION

- A. Install precast concrete vaults according to ASTM C 891.

3.15 PROTECTIVE ENCLOSURE INSTALLATION

- A. Install concrete base level and with top approximately 2 inches above grade.
- B. Install protective enclosure over valves and equipment.
- C. Anchor protective enclosure to concrete base.

3.16 CONNECTIONS

- A. Connect water-distribution piping to interior [domestic water and fire-suppression piping].

3.17 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.
 - 1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per

100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

- C. Prepare reports of testing activities.

3.18 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Section 312000 "Earth Moving."

3.19 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
 - 1. Use purging and disinfecting procedure prescribed by Kentucky American Water.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 22 1113

SECTION 221313 – EXTERIOR FACILITY SANITARY SEWERS

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe and fittings.
 - 2. Nonpressure couplings.
 - 3. Expansion joints and deflection fittings.
 - 4. Cleanouts.
 - 5. Manholes.

1.3 DEFINITIONS

- A. PVC: Polyvinyl Chloride Pipe.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Expansion joints and deflection fittings.
 - 2. Pipe and fittings
- B. Shop Drawings: For manholes. Include plans, elevations, sections, details, and frames and covers.
- C. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewer system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
- D. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.
- E. Field quality-control reports.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage. In particular, the load shall be supported that the bottom rows of pipe are not damaged by crushing. Pipe shall be unloaded carefully and strung or stored as close to the final point of placement as is practical.
- C. Handle manholes according to manufacturer's written rigging instructions.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Sewerage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
1. Notify Engineer or Owner no fewer than two days in advance of proposed interruption of service.
 2. Do not proceed with interruption of service without Engineer's or Owner's written permission.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS FOR GRAVITY SEWER

- A. PVC Sewer Piping:
1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
 2. Fittings: ASTM D 3034, PVC with bell ends.
 3. Gaskets: ASTM F 477, elastomeric seals.
 4. Pipe shall be homogenous throughout and free from cracks, holes, foreign inclusions or other defects. The pipe shall be as uniform as commercially practical in color. The workmanship, pipe dimensions and tolerances, outside diameters, wall thickness, eccentricity, sustained pressures, marking and all other requirements of the Commercial Standards CS 256-63 shall be conformed within all respects.

2.2 PVC PIPE AND FITTINGS FOR FORCE MAIN SEWER

1. Pipe: ASTM D 2241, SDR 21 (220 PSI), PVC Type pressure rated pipe with bell and spigot ends for sealed joints. Cell class 12454 per ASTM D 1784.
2. Fittings: Pipe and fittings shall be manufactured as a system and be the product of one manufacturers.
3. Pipe and fittings shall conform to NSF International Standard 61 or the health effects portion of NSF Standard 14.
4. Gaskets: ASTM F477
5. Standard lengths shall be 20 feet and 12.5 feet plus/minus 1 inch. All pipe shall be marked with the manufacturer's name, production lot number, ASTM designation, PVC and nominal diameter.

2.3 DUCTILE-IRON, GRAVITY SEWER PIPE AND FITTINGS

- A. Pipe: ASTM A 746, for push-on joints.
- B. Standard Fittings: AWWA C110, ductile or gray iron, for push-on joints.
- C. Gaskets: AWWA C111, rubber.
- D. Ductile iron pipe shall conform to the latest AWWA Specifications C151 (ANSI A21-51) with standard thickness as designated in AWWA C150. Thickness class shall be as follows:

DIAMETER	PRESSURE CLASS
8" - 12"	350
14" - 30"	250

2.4 NONPRESSURE-TYPE TRANSITION COUPLINGS

A. Mechanical Joint Fittings:

1. Mechanical joints shall be bolted and of the stuffing box type and shall consist of a bell with exterior flange and interior recess for the sealing gasket, a pipe or fitting plain end, a sealing gasket, a follower gland, tee-head bolts and hexagon nuts.
2. Joints for all bends and fittings for buried service shall be mechanical joint type only (AWWA C111). Flanged joint pipe shall be used in vaults, pits and above ground service installation. Flanged joint pipe may not be used for buried service.

B. Nonpressure-Type, Rigid Couplings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ANACO-Husky.
2. Description: ASTM C 1461, sleeve-type, reducing- or transition-type mechanical coupling, molded from ASTM C 1440, TPE material; with corrosion-resistant-metal tension band and tightening mechanism on each end.

2.5 CLEANOUTS

A. Cast-Iron Cleanouts:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Josam Company.
 - b. MIFAB, Inc.
 - c. Smith, Jay R. Mfg. Co.
 - d. Tyler Pipe.
 - e. Watts Water Technologies, Inc.
 - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
3. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

2.6 MANHOLES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section; with separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, of length to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated; with top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
9. Steps: ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP; wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
10. Adjusting Rings: Interlocking HDPE rings, with level or sloped edge in thickness and diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.
11. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.
12. Waterproof seal coating shall be applied to the exterior of all manholes.
13. Manholes over 12 feet deep shall utilize Class III concrete.

B. Manhole Frames and Covers:

1. Material: ASTM A 48/A 48M, Class 35 gray iron unless otherwise indicated.

C. Manhole Types:

1. Type "A" Manholes: The Type "A" manhole shall be a four foot diameter manhole five feet or more in depth, measured from the base of the cover frame to the lowest flowline elevation and shall be of eccentric cone top construction.
2. Type "AA" Manholes: The Type "AA" manhole shall be a five foot diameter manhole five feet or more in depth, measured from the base of the cover frame to the lowest flowline elevation and shall be of eccentric cone top construction.
3. Type "AAA" Manholes: The Type "AAA" manhole shall be a six foot diameter manhole five feet or more in depth, measured from the base of the cover frame to the lowest flowline elevation and shall be of eccentric cone top construction.
4. Type "B" Manholes: Type "B" manholes shall be a four foot diameter manhole five feet or less in depth, measured from the base of the cover frame to the lowest flowline elevation and shall be of flat slab top construction.

5. Type "D" Manholes: A drop pipe shall be provided for a sewer entering a manhole at an elevation of 25 inches or more above the manhole invert and shall be built as a part of the standard manhole. The pipe shall be laid as shown on the Drawings and encased with 3500 psi concrete from the drop stack to the reinforced base of the manhole.

2.7 CONCRETE

- A. General: Cast-in-place concrete complying with ACI 318, ACI 350/350R, and the following:
 1. Cement: ASTM C 150, Type II.
 2. Fine Aggregate: ASTM C 33, sand.
 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
 - a. Invert Slope: 1 percent through manhole.
 2. Benches: Concrete, sloped to drain into channel.
 - a. Slope: 4 percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- E. Concrete Cradle, Anchors or Encasement:
 1. Concrete cradle or encasement of sewer lines and/or fittings shall be placed where shown on the plans. Sewers on 19 percent slopes or greater shall be anchored securely with concrete anchors, spaced as follows:
 - A) Not over 36 feet center to center on grades 19 percent and up to 35 percent.
 - B) Not over 24 feet center to center on grades 35 percent and up to 50 percent
 - C) Not over 16 feet center to center on grades 50 percent and over

2. Concrete shall be KYDOH Class "B" and shall be mixed sufficiently wet to permit it to flow under the pipe to form a continuous bed. In tamping concrete, care shall be taken not to disturb the grade or line of pipe or injure the joints.
3. For this contract, concrete for pipe encasement and anchors is considered an incidental item included in the linear foot price of pipe.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 310 Section "Earth Moving."

3.2 PIPING INSTALLATION

- A. Contractor shall provide necessary leveling equipment to check the elevation of the flow line of the pipe as follows:

GRADE	FLOW LINE ELEVATION CHECK	ALLOWABLE ERROR
.004 - .008	Every 100 feet	± .03
.008 - .012	Every 150 feet	± .05
Above .012	Every 190 feet	± .07

- B. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- C. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.
- D. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- E. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- F. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- G. Install gravity-flow, nonpressure, drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 1 percent unless otherwise indicated.
 2. Install piping NPS 6 and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place-concrete supports or anchors.
 3. Install piping with 36-inch minimum cover.
 4. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
- H. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.
- 3.3 PIPE JOINT CONSTRUCTION
- A. Join gravity-flow, nonpressure, drainage piping according to the following:
1. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
 2. Join dissimilar pipe materials with nonpressure-type, rigid couplings.
- B. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
1. Use nonpressure flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.
 - a. Shielded flexible or rigid couplings for pipes of same or slightly different OD.
 - b. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
- 3.4 MANHOLE INSTALLATION
- A. General: Install manholes complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Form continuous concrete channels and benches between inlets and outlet.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.
- E. Pipe entering and leaving manholes shall be installed a link seal compression device in accordance with ASTM d-2240, D412, s-395, d-297
- F. Visual Inspection/Test: The ENGINEER shall visually inspect the manhole barrel, in the presence of the CONTRACTOR, after CONTRACTOR completes the preparatory cleaning activities. If the Engineer's visual inspection reveals obvious defects such as a poorly formed invert, misaligned frame and lid, cracks, leakage, or if the inspection reveals that the CONTRACTOR has not constructed the manhole plumb, the ENGINEER shall notify the CONTRACTOR and OWNER in writing of the manhole's failing the visual inspection. The CONTRACTOR shall subsequently repair or replace all defective materials and/or workmanship, necessary to meet the visual test requirements, at no additional cost to the OWNER.

- G. Leakage: The ENGINEER will direct the CONTRACTOR to conduct leakage tests if the manhole is located in an area of unusually high ground water, if the manhole is located within the limits of a stream course, or if, in the ENGINEER's opinion the manhole has not been constructed well. The CONTRACTOR shall subsequently conduct a leakage test in the presence of the ENGINEER. The leakage test shall be an exfiltration test conducted in accordance with ASTM C 969, Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines. The maximum allowable exfiltration rate shall be 0.1 gallon per foot of diameter, per foot of head, per hour. If the exfiltration rate exceeds this value, the CONTRACTOR shall make the necessary repairs, at no additional cost to the OWNER.

3.5 INSTALLATION OF FORCE MAINS

- A. General. Before any length of pipe is placed in the trench, make a careful inspection to see that no foreign material is in the pipe. In order to properly remove any foreign materials, a swab of necessary length is to be available at all times. All pipe shall be lowered carefully into the trench, properly aligned and properly jointed by use of suitable tools and equipment, in such manner as to prevent damage to protective coatings and linings. Excessive scratching of the exterior surface of the pipe will be cause for rejection of the pipe.

Under no circumstances shall pipeline materials be dropped or dumped into the trench. The pipe and fittings shall also be inspected for the purpose of determining if they are sound and free from cracks. Laying of pipe shall be commenced immediately after excavation is started. Pipe shall be laid with bell ends facing in the direction of laying.

When pipe laying is not in progress, the open ends of pipe shall be closed to prevent entrance of trench water into the line. Whenever water is excluded from the interior of the pipe, adequate backfill shall be deposited on the pipe to prevent floating. Any pipe which has floated shall be removed from the trench and installed properly. No pipe shall be laid in water or on frozen trench bottom or whenever the trench conditions or the weather are unsuitable for such work.

If any defective pipe and fittings shall be discovered after the pipeline is laid, they shall be removed and replaced with a satisfactory pipe or fitting without additional charge to the Owner. Open ends of unfinished pipelines shall be securely plugged or closed at the end of each day's work or when the line is left temporarily at any other time.

- B. Thrust Blocking and Anchorage. All angles or bends in the pipeline, either vertical or horizontal, shall be braced or anchored against the tendency of movement with concrete thrust blocking. Where joint harness is used, all component parts shall be stainless steel. Cost of installing concrete thrust blocking or joint harness materials shall be considered incidental to installing the line. Thrust blocks for plastic pipe will not be attached to couplings.
- C. Pipe Bedding. Standard Pipe Bedding. The standard pipe bedding shall be evenly spread fine granular earth material or bank run sand and gravel or dense graded aggregate as shown on the PLANS.
- D. Special Pipe Foundation. When ordered by the Engineer, yielding and mucking material in subgrade shall be removed below ordinary trench depth in order to prepare a proper bed for the pipe. In such locations, a special pipe foundation shall be constructed utilizing encasement class concrete.
- E. Standard Concrete Encasement. Concrete encasement of pipe shall be placed as directed by the Engineer. Concrete shall form a continuous bed under pipe. In tamping concrete, care should be taken not to disturb the grade or line of the pipe or injure the joints.

- F. **Parallel Water and Sewer Lines.** Water lines must, if possible, be located a minimum lateral distance of 10 feet from any existing or future sewer lines measured from outside diameters. Where water lines and sewer lines must be placed in the same trench, the water line must be located above the sewer line such that there is a minimum of 18" vertical distance between the outside of the water line and the outside of the sewer line.
- G. **Crossing Water and Sewer Lines.** Wherever sewer lines and water lines cross, it is desirable, if practical, that the sewer line be at least 24 inches below the water line. Where it is not practical to provide such a separation, care shall be taken to ascertain that the existing water line or existing sewer line is in good sound condition and that no evidence of joint leakage is known in that vicinity. If any such evidence does exist, expose the existing line at least 10 feet on each side of the water line crossing. The Owner will arrange for examining and correcting any defects in the existing lines. When the water line must be below or less than two feet above the sewer line, encase the water line five feet in each direction from the crossing.

3.6 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

3.7 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts, and use cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
 - 1. Use Heavy-Duty, top-loading classification cleanouts in all areas.
- B. Set cleanout frames and covers in earth in cast-in-place-concrete block, 12 by 12 by 12 inches deep. Set with tops 1 inch above surrounding grade.
- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.8 CONNECTIONS

- A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Division 220 Section "Sanitary Waste and Vent Piping."
- B. Make connections to existing piping and underground manholes.
 - 1. Make branch connections to underground manholes by cutting opening into existing unit large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe or manhole wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
 - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
 - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

2. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.9 IDENTIFICATION

- A. Materials and their installation are specified in Division 312 Section "Earth Moving." Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.

1. Use detectable warning tape over nonferrous piping and over edges of underground manholes.

3.10 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Prior to owner acceptance, piping systems shall be tested according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:
 - a. Fill sewer piping with water. Test with pressure of at least 10-foot head of water, and maintain such pressure without leakage for at least 15 minutes.
 - b. Close openings in system and fill with water.
 - c. Purge air and refill with water.
 - d. Disconnect water supply.
 - e. Test and inspect joints for leaks.
6. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

- a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
 - b. Option: Test concrete gravity sewer piping according to ASTM C 924.
7. Manholes: Perform hydraulic test according to ASTM C 1244.
8. Force Mains: The Contractor will be required to test all pipelines and appurtenances with water at pressure class of pipe installed. The pipe shall be slowly filled with water, care being taken to expel all air from the pipes. If necessary, the pipe shall be tapped at high points to vent the air. Pressure at least equal to 150 PSI (or the operating pressure if higher) as measured at the point of lowest elevation shall be applied for not less than one hour and all pipes, fittings, valves, hydrants and joints shall be carefully examined for defects or leakage. Any observed leakage shall be corrected.
- a. The pipe pressure must be held at 150 PSI for one hour before beginning the test for leakage. No pipe shall be accepted unless or until the leakage, determined by this test, is less than 10 U.S. gallons over 24 hours, per mile, per inch nominal diameter of pipe. The leakage test shall be applied to the pipe for a period of not less than 4 hours.
 - b. The test shall be made between valves as far as practical in sections of pipe and shall, in general, be made within twelve working days of the completion of each section of line.
 - c. Furnish a suitable pump, pressure gauge and water meter or other appliance for measuring the amount of water pumped. The instrument used to measure leakage shall be tested for accuracy. Furnish all necessary labor and materials to make the test and to perform any work incidental thereto. Where it is impractical to test between the valves, temporarily place caps and plugs on the lines and test sections of the new line.
 - d. Wherever practicable, corporation stops and service lines shall be installed before testing. If these items are installed after the main is tested, then a visual inspection of the tap and service line must be permitted while under pressure before backfilling service line.
 - e. Where any section of the main is provided with concrete thrust blocking, the hydrostatic pressure test shall not be made until at least five days have elapsed after the concrete reaction blocking was installed. If high early strength cement is used in the reaction blocking, the hydrostatic pressure test shall not be made until at least two days have elapsed.
 - f. Should there be leakage over the allowable amount, the Contractor will be required to locate and repair the leaks and retest the section. It is suggested, but not required, that the Contractor have a geophone (underground listening device) on the job at the time of testing.
 - g. If the leakage of the section of pipeline being tested is below the allowable amount, but leakage is obvious due to water at the surface of the ground, or by listening the leak can be heard underground with a geophone, or any other means of determining a leak, the Contractor will be required to repair these leaks.
 - h. The Contractor shall furnish a meter or suction tank, pipe test plugs and by-pass piping and make all connections for conducting the above tests. The pumping equipment used shall be centrifugal pump, or other pumping equipment which will not place shock pressures on the pipeline. Power plunger or positive displacement pumps will not be permitted for use on closed systems for any purpose.
 - i. Inspection of pipe laying shall in no way relieve the Contractor of the responsibility for stopping leakage or correcting poor workmanship.
- C. Leaks and loss in test pressure constitute defects that must be repaired.

- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.11 CLEANING

- A. Clean dirt and superfluous material from interior of piping. Flush with potable water.

END OF SECTION 221313

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 SCOPE OF WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The work included under Division 26 shall consist of furnishing labor and materials necessary for the complete installation of electrical systems shown on the Contract Drawings and Specifications. Work shall be complete and in operating condition at the completion of Contract.
- C. Include minor items which are obviously and reasonable necessary to complete the installation and usually included in similar work even though not specifically mentioned in the Contract Documents.
- D. Deviations due to particular manufacturer's requirements shall be provided at no additional cost to the Owner.
- E. Where material quantities are shown, they are for the convenience of the Contractor only. The Contractor shall be responsible to verify quantities.
- F. Coordinate with the Other Contractors for coordination drawings for all disciplines. Coordination drawings shall include plan view and elevations.
- G. Coordinate with Other Contractors as to low voltage systems to be removed and/or replaced with project phasing.
- H. Coordinate with structural for penetration through structural members. Exposed conduit on ceiling is not acceptable.
- I. The model numbers and series of the equipment (where mentioned) are current at the time the contract documents were prepared. Some of the model numbers or series/lines may be end-of-life or obsolete at the time submittals are created or when equipment is ordered for installation. Verify model numbers and software/firmware prior to ordering the equipment to review the status of the models. Provide current model equipment and software providing equivalent or better performance and features at no additional cost to the Owner.

1.2 RELATED WORK

- A. Divisions 00 and 01 apply to all work of Division 26 and are an integral part of this Section. Where the conditions specified are at variance with other Divisions, this Section takes precedence. This Section specifies conditions, procedures, equipment and material particular to the electrical work and applies to all electrical work of the Contract Documents.
- B. Division 00 and 01 and this Section and all Addenda form a part of and apply to all contracts or sub-contracts relating to Division 26 and 27 work. Copy these documents to all Sub-contractors

receiving other Sections of Division 26 and 27.

- C. Where a Specification Section refers to other sections under the Article of Related Work, this is done for Contractor's convenience only. It shall not relieve the Contractor of responsibilities stated in other Sections of the Specifications. The Contractor is responsible for information contained in this division's Specifications as well as for electrical requirements and information contained in other divisions.

1.3 PERMITS, LICENSES, AND FEES

- A. Provide temporary permits, permanent permits and licenses required for the completion of the work included under this contract. Fees and expenses required to obtain such permits shall be paid for by the electrical contractor.
- B. Provide inspections as requested by each contractor and as required by regulating agencies or where required by code. Include and pay charges for inspection agencies and provide the Owner with a certificate of final inspection and approval by authority having jurisdiction.
- C. Refer to General Conditions for state and local sales tax requirements. Provide records of these taxes to the Owner upon request.

1.4 REFERENCES

- A. Material and workmanship to comply with applicable codes. As a minimum include State and Federal laws, local ordinances, Utility Company regulations and requirements and interpretations of the following by the local authority having jurisdiction:
 - 1. State and Local Building Codes.
 - 2. State and Local Fire Codes.
 - 3. National Electrical Code.
 - 4. State and Local Electrical Codes.
 - 5. OSHA Regulations.
 - 6. State Elevator Code.
 - 7. State and Local Energy Codes.
 - 8. State and Local Accessibility Codes.
 - 9. State Department/Board of Health Requirements.
 - 10. State and Local Fire Marshal Requirements.
- B. Comply with all of the following codes and standards as a minimum:
 - 1. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
 - 2. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
 - 3. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. If drawings and specifications are in conflict with these codes, notify the Engineer prior to rough-in.
- D. Where requirements of the drawings and specifications exceed or are greater than codes, laws, regulations, and standards, the requirements of the drawings and specifications shall be

followed.

- E. The following is list of organizations and their abbreviations where referred to in the specifications as standards of construction.
1. ADA – Americans with Disabilities Act
 2. ANSI - American National Standards Institute
 3. ASHRAE – American Society of Heating, Refrigeration and Air Conditioning Engineers
 4. ASIS International - American Society for Industrial Security
 5. ASTM – American Society for Testing and Materials
 6. BICSI - Building Industry Consulting Service International
 7. DHS - Department of Homeland Security
 8. FM – Factory Mutual
 9. IEC - International Electrotechnical Commission
 10. IEEE – Institute of Electrical and Electronic Engineers
 11. ISO - International Organization for Standardization
 12. NEC – National Electrical Code (NFPA 70)
 13. NECA - National Electrical Contractors Association
 14. NEMA – National Electrical Manufacturers Association
 15. NESC - National Electrical Safety Code
 16. NFPA – National Fire Protection Agency
 17. NIST – National Institute of Standards and Technology
 18. OSHA – Occupational Safety and Health Administration
 19. TIA - Telecommunications Industry Association
 20. UFAS - Uniform Federal Accessibility Standards
 21. UL – Underwriters' Laboratories, Inc.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Pre-Construction Submittal Meeting: Contractor shall schedule web conference (WebEx, Go-To Meeting, Skype or similar) with Consultant to review basis of design and submittal expectations prior to submittals.
- B. Prior to Work: Pre-construction submittals shall be provided to Consultant with appropriate promptness as to cause no delay to the work.
- C. Project Timeline: Project timeline will not be altered due to lateness of submittals. Contractor will remain bound to deliver a timely, complete, and finished project as stipulated in their contract and specified herein.
- D. Failure to Provide: The failure of Contractor to provide pre-construction submittals or meetings as required herein may result in the withholding of payment for work and/or the cancellation of the contract.
- E. Coordination:
1. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for communications devices.

2. Coordinate arrangement of communications devices with the dimensions and clearance requirements of the actual equipment to be installed.
3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.6 DEFINITIONS

A. The terms listed below are defined as follows:

1. **Furnish:** Obtain, coordinate, deliver to the job site and guarantee.
2. **Supply:** Same as Furnish.
3. **Install:** Furnished by others, receive on site, unload, store, set in place, connect, place in operation and guarantee workmanship of installation.
4. **Provide:** Furnish and install.
5. **Connect:** Bring service to the equipment and make final attachments, including necessary disconnect switches, control switches, outlets, etc.
6. **Conduit:** In addition to conduit includes fittings, hangers, pullboxes, supports, etc. as required for a complete and proper installation.
7. **Concealed:** Hidden from sight in walls, ceilings or floors.
8. **Exposed:** Surface mounted, not hidden from sight.
9. **Building Structure:** Columns, beams, joists, walls. Metal decking, joist bridging shall not be used for supporting electrical equipment.
10. **As Required:** As needed to provide a complete and satisfactorily operating system complying with all governing codes and the intent of the project contract documents.
11. **Approved Equal:** The manufacturer names mentioned are to set a standard, and another manufacturer, model brand name may be used if fully equal or superior in all aspects at the opinion of the engineer. Contractor shall obtain approval from Engineer for substitute manufacturer. Refer to Division 01 for Product Substitution forms and required procedures. Submit completed product substitution form(s) with any proposed alternate manufacturers.
12. **Prior Approved Equal:** Approved Equal that Contractor shall obtain approval (issued via addendum) prior to bid. Submit to architect & engineer with all required forms a minimum of 8 business days prior to bid date.

1.7 DRAWINGS & SPECIFICATIONS

- ### A. Furnish all labor, equipment and material for the complete installation of the systems indicated and specified.
1. The drawings accompanying the specifications are diagrammatic and are intended to indicate the approximate and relative locations of services and equipment; the drawings shall not be scaled.
 2. Verify building dimensions with dimensions on architectural drawings.
 3. Because the drawings are diagrammatic and on a small scale, all conduits, pathways, etc. have not been shown but shall be provided under this contract.
- ### B. Install all systems and individual equipment according to the manufacturer's installation instructions and recommendations.
1. Where these differ from these Contract Documents, contact the Engineer immediately.

- C. All conduits, cable tray, outlets, and equipment shall be coordinated and installed to avoid interference with all other trades.
 - 1. Field changes necessary or as a result of varying construction conditions shall have the written acceptance of the Architect prior to modifications.
- D. The Contractor shall maintain an up-to-date record set of drawings and specifications at the job site. Transfer all field changes to one (1) clean set at time of substantial completion and submit to Architect prior to final acceptance.
- E. In specifying particular materials and/or methods, the intent is to indicate the minimum standard of quality acceptable to Owner.
 - 1. If a case occurs where these Contract Documents do not meet the minimum standards of existing federal, state and local codes regulations and requirements, then those governing codes, regulations and requirements shall prevail.
- F. Manufacturer Selection
 - 1. Where one manufacturer, model or brand name is specified alone, no substitution will be allowed, except if approved by Owner as an alternate.
 - 2. Where more than one manufacturer, model or brand name is specified for the same item, the Contractor may choose between them.
- G. Should equipment furnished be different from the Model Numbers in the specifications, schedules, or drawings, the Contractor initiating such change will be responsible for all extra costs.
 - 1. Acceptance of substitutions shall in no way relieve the Contractor from the responsibility for any deficiency, which may exist in the substitute product, or that may result from performing the required work with the substitute.
 - 2. If the accepted substitutions shall require changes or modifications to the work of any other trades, such changes shall be considered part of the substitution and shall be coordinated and performed by the Contractor at no additional cost to the Owner.
 - 3. Verify and coordinate all dimensions and other pertinent characteristics of the substituted materials with the requirements of all other parts of the building system and project.
- H. The Contract Documents refer to a complete set of Drawings and Specifications for the entire Project. Drawings and Specifications are intended to supplement one another. Provide items shown on the Drawings but not mentioned in the Specifications and items mentioned but not shown the same as if they were both mentioned and shown. Bid the higher cost interpretation of a conflict between Drawings and Specifications so the conflict can be resolved with a deduct rather than an add to the contract amount.

1.8 ELECTRONIC DRAWING FILES

- A. CAD Drawing Files
 - 1. The electrical CAD drawing files prepared by KFI Engineers for this project are Instruments of Service of KFI Engineers for use solely with respect to this project and will not be made available to the Contractor.
 - 2. Request CAD drawing files of Architectural floor plans, elevations, sections, etc. directly from the Architect.

1.9 SUBMITTALS

- A. Substitutions shall be submitted through a bidding contractor and submitted to engineer 10 working days prior to bid opening. Include detailed information concerning substitution. Acceptable substitutions will be issued in an Addendum to the Contract Documents prior to the bid date. Extra costs incurred as a result of substitution, including those of other contractors are the responsibility of the submitting contractor, including engineering redesign costs.
- B. Submittals shall be done in accordance with the General Conditions and as listed under Division 01.
1. Submit copies for each item as required per individual sections of the specifications.
 2. Submit each specific section number separately and all submittals listed as "Before Installation" together in a single submittal. (i.e. 26 05 33.13 - Conduit for Electrical Systems).
 3. CAD drawing files (backgrounds) shall be requested directly from the Architect.
 4. Submit all submittals electronically with the exception of Samples and the final O&M manuals/record drawings.
 - a. Format
 - 1) PDF Creation: All Submittals shall be combined to one single, text-searchable PDF file. OCR pages if not text-searchable.
 - (a) 300 DPI Color minimum
 - 2) Bookmarking: Bookmarking of PDF shall be extensive.
 - b. The Contractor will review, stamp, and send to the Engineer for review with at least 1/2 of 8.5x11 inch page available for Engineer stamp and comments. The Engineer will retain reviewed copies for their files and forward copy to the Architect, Owner and to the Contractor.
- C. Submittals for each portion of the Work shall be complete and accurate. Incomplete or partial submittals will be rejected and will require resubmittal.
1. Submittals may be made of portions of the Work, but each Submittal shall be complete in respect to the information necessary for proper review by Engineer.
 2. All Submittals for each specification section shall be combined (unless noted otherwise) to ensure "design intent" of the system assembly.
 3. Show dimensions and clearances required for each piece of equipment.
 4. Clearly mark each copy to identify pertinent products or models being proposed.
 5. Cross out non-related material to submittal. Any accessories or optional items that are not crossed out will be assumed to be included.
- D. Some submittals shall be submitted before installation and some shall be after installation. Most shall be before installation but some examples of items to be included in submittals after construction include (but are not limited to):
1. Field Test Reports
 2. Installation Instructions
 3. O&M Manuals
 4. Record Drawings

- E. Submit Record Drawings in accordance with the General Conditions and as listed under Division 00 and 01. Electrical contractor shall maintain on job site an entire set of complete up to date record drawings throughout construction (full size set of construction documents with changes). Electrical contractor shall include, but not limited to, the following: Addenda, Proposal Requests, Architectural Supplemental Instructions, Requests for Information, Field Modifications, Owner Changes, contractor initiated changes, etc. and branch circuiting, home runs, junction boxes, pull boxes, etc., relocated devices, etc. and remote power supplies, control boxes, and controls. One-line and riser diagrams shall reflect field changes.
- F. Submit Operating, Maintenance and Warranty Data Manuals in accordance with the General Conditions and as listed in Division 00 and 01.
- G. Submittals will be reviewed by the Engineer, with one of the following actions checked on the submittal stamp:
 - 1. NO EXCEPTIONS TAKEN-Indicates the Submittal appears to conform to the design concept of the Work and that the Contractor at their discretion, may proceed with fabrication and/or procurement and installation.
 - 2. CORRECT AS NOTED-Indicates that the Submittals, after noted corrections are made, would appear to conform to the design concept of the Work and that the Contractor, at their discretion, may proceed with fabrication and/or procurement and installation, if the corrections are accepted by the Contractor without an increase in Contract Sum or Time.
 - 3. REVISE & RESUBMIT-Indicates that the Submittals, after noted corrections are made, would appear to conform to the design concept, but need to be resubmitted reviewed and approved prior to proceeding with fabrication and/or procurement and installation, if the corrections are accepted by the Contractor without an increase in Contract Sum or Time.
 - 4. REJECTED-Indicates that the Submittal does not appear to conform to the specifications, and that a complete resubmittal is required. The Contractor shall not proceed with fabrication or procurement.
 - 5. SUBMIT SPECIFIED ITEM-Either the specified item is anticipated to be required in submittal (and was not), or this indicates that the Submittals, even with corrections would not conform to the design concept of the Work and that the Contractor must submit the specified item without an increase in Contract Sum or Time.
 - 6. NO ENGINEER ACTION REQUIRED-Indicates the Contractor may proceed without review of the Submittal based on provisions of the Contract Documents.
- H. Resubmittals
 - 1. Required Revisions: Make corrections or changes in submittals required by KFI Engineers and resubmit when Engineer's stamp requires resubmittal.
 - a. Clearly identify changes made other than those requested by KFI Engineers by "clouding" or other suitable means acceptable to Engineer for noting changes. Only changes that are "clouded" and changes requested by KFI Engineers will be reviewed on a resubmittal. KFI Engineers is not responsible for reviewing resubmittals that are not "clouded" on resubmittal.
 - 2. If the Engineer rejects (Revise & Resubmit, Submit Specified Item, or Rejected) two (2) times for the same section the Engineer will be compensated for any additional reviews. Compensation will be incorporated by Change Order and deducted from the Contractor's application for payment.
 - 3. Contractor is responsible for delays caused by the resubmittal process.

1.10 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Initiate, maintain and supervise all safety precautions required with this work in accordance with the regulations of the Occupational Safety and Health Administration (OSHA) and other governing agencies.
 - 2. The Contractor, after completion of the work, shall furnish the Owner a Certificate of final inspection and approval from the inspection bureaus having jurisdiction.
- B. Environmental Requirements:
 - 1. Do not remove or disturb any asbestos containing materials from the project. Immediately stop work and notify the Owner if asbestos containing materials are suspected.
 - 2. Dispose of any PCB containing materials as per local and national requirements.
 - 3. Separate, store and dispose of regulated waste according to local, state and federal regulations.
- C. Provide new, first quality material for all products specified. Do not reuse materials unless indicated or approved by the Engineer.
- D. Comply with the NEC as applicable to the construction and installation of equipment specified in this section.
- E. Provide equipment specified throughout divisions 26, 27, and 28 that has been listed and labeled by a nationally recognized testing laboratory.
- F. Comply with ANSI as applicable to equipment specified in this section.
- G. Comply with NEMA as applicable to equipment specified in this section.
- H. Verify prior to printing, labeling, ordering, or programming that the room names and room numbers utilized match the actual final installed room names and room numbers. Coordinate with Owner and architect for final room numbering to be utilized.

1.11 PROJECT/SITE CONDITIONS

- A. Inspection of Site:
 - 1. Before submitting a proposal on the Work, the Contractor and Subcontractors shall examine the site of the proposed work and thoroughly familiarize themselves with existing conditions and limitations affecting the performance of their Work. No extra compensation will be allowed because of a misunderstanding as to the amount of Work involved or lack of knowledge of existing conditions which could have been discovered or reasonable anticipated prior to bidding.
- B. Correlation of Work:
 - 1. Consult the drawings and specifications of all other Divisions for correlating information and lay out work so that it will coordinate with other trades. Verify dimensions and conditions (i.e., finished ceiling heights, footing and foundation elevations, beam depths, etc.) with the Architectural and Structural drawings. Notify the Architect of any conflicts

that cannot be resolved, in the field, by affected trades. Replacement of work due to lack of coordination and failure to verify existing conditions will be completed at no cost to the Owner.

2. Install all conduit, cable tray, busduct, equipment, etc. allowing proper code and maintenance clearances and to avoid blocking passageways and access panels.
3. Where work must be replaced due to the failure of the Contractor to verify the conditions existing on the job, such replacement must be accomplished at no cost to the Owner. This applies to shop fabricated work as well as to work fabricated in place.
4. Throughout the course of the work, minor changes and adjustments to the installation may be requested by the Engineer. The Contractor shall make adjustments without additional cost to the Owner, where such adjustments are necessary to the proper installation and operation within the intent of the Contract Documents. This does not include work already completed.
5. Equipment outlines shown on detail plans of 1/4"=1'-0" scale or larger and/or dimensions indicated on the plans are limiting dimensions. Do not install any equipment that exceeds the equipment outlines shown or reduces indicated clearances.
6. Obtain exact location of connection to equipment, furnished by others, from the vendor/contractor furnishing the equipment.
7. Drawings and specifications are complementary and what is called for in either one is as binding as if called for in both.
8. Include the better quality, greater quantity, and higher cost for an item or arrangement where a disagreement exists in the drawings and specifications.

1.12 TEMPORARY ELECTRICAL SERVICE

- A. Provide and maintain a complete temporary electrical power service for the use of all trades during construction.
 1. Refer to general Conditions for responsibilities for energy costs charges.
 2. Refer to Architectural Contract Documents for any phasing or additional requirements
 3. Locate duplex receptacles throughout the floor so that any point within the building or construction can be reached by a 100 ft. extension cord. Provide GFCI protected duplex outlets.
 4. Special service requirements such as large heating loads, welders, three-phase equipment, etc., shall be paid for by the contractor requiring such service.
 5. Provide connection and disconnection of electrical power to all contractor trailers/spaces as required. Coordinate with other contractors.
 6. Provide temporary elevator power connection as required.
- B. Provide and maintain a complete temporary lighting service for use by all trades during construction.
 1. Provide adequate lighting suitable for conditions for high quality workmanship and for safety throughout the area of construction. Provide minimum requirements of one (1) 200 watt luminaire per each 400 square feet or per room, whichever is smaller.
 2. Provide LED strip lighting as required in areas traversed or occupied by building occupants.
 3. Provide and maintain an exit and egress safety lighting system where required by code or OSHA.

1.13 WARRANTY

- A. Provide guarantee of workmanship and materials for the period of one (1) year after final completion of the work as evidenced by issuance of the final certificate by the Architect.
- B. Correct defects at contractors expense those defects due to faulty workmanship or materials that arise during the warranty period and make corrections to the satisfaction of the Owner and Engineer. Reconstruction and repairs shall include damages to the finish or the building resulting from the original defect.
- C. Guarantee shall cover shipping and handling any required components to the site and correcting defects (materials and labor).
- D. Guarantee does not apply to injuries occurring after final acceptance and due to wind, fire, violence, abuse or carelessness or other Contractors or their employees or the agents of the Owner.
- E. This guarantee shall be longer where other guarantees for longer lengths of time are noted otherwise.
- F. Any complaints received by the Architect due to adjustments, repair of operation, difficulties, or the need for replacement within the construction phase or the guarantee time will be turned over to the Contractor.
 - 1. Upon the receipt of complaint from the Architect or Owner, the Contractor shall investigate complaint immediately, and complete the necessary work within seventy-two (72) hours, or as directed in writing by the Architect.
 - 2. When any delay in repair or replacement would result in damage to the Owner's facility or affect Owner occupancy and intended use, or to maintain design environmental conditions, the Contractor shall respond within four (4) hours of notice.
- G. Warranty related repairs or replacement shall be completed within 14 days of notice by the Architect. Schedule and perform repairs immediately if delay interferes with Owner occupancy or will result in damage to the Owner facility.

PART 2 PRODUCTS

2.1 TAMPERPROOF HARDWARE

- A. Where tamperproof or tamper resistant hardware is called out, provide torx head with center pin reject hardware for the following electrical work:
 - 1. Luminaire housings
 - 2. Covers to electrical enclosures, pullboxes, cabinets, junction boxes, wireways
 - 3. Coverplates (provide maximum security stainless steel coverplates)

PART 3 EXECUTION

3.1 ROUGH-IN

- A. Verify locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Consult the Contract Drawings and Specifications of other Divisions and other trades for correlating information and layout work so that it will not interfere with other trades. Verify dimensions and conditions; i.e., finished ceiling heights, wall elevations, sections, footing and foundation elevations, beam depths, ductwork and piping, etc. with architectural, mechanical and structural drawings. If conflicts occur such that resolution is not possible by the affected trades on the job, notify the Architect so a resolution can be worked out. Where work must be replaced due to failure to verify conditions existing on the job, such replacement shall be accomplished at no extra cost to the Owner. This shall apply to shop fabricated Work as well as work fabricated in place.

3.2 INSTALLATION

- A. Arrange for chases, slots, and openings in other building components during progress of construction to allow for electrical installation.
- B. Install material and equipment in accordance with manufacturers' recommendations, instructions, and current NECA and UL standards.
- C. Install equipment and materials to provide required access for servicing and maintenance. Coordinate equipment location with required access panels and doors. Allow ample space for removal of parts that require replacement or servicing.
- D. Coordinate the installation of required supporting devices and sleeves with structural components.
- E. Coordinate with other trades before installing equipment so that conflicts will be adjusted before installation. In general large mechanical equipment shall be given priority. Maintain, wherever practical, a minimum separation of 3" from water and waste piping and 12" from hot water and steam piping.
- F. Electrical equipment, outlet boxes, conduits, etc shall not be attached or otherwise fastened to ductwork or other mechanical equipment unless noted otherwise.
- G. Cutting and patching shall be performed in accordance with the provisions of the General Conditions.
- H. Install systems, materials and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed in finished areas unless noted otherwise.
- I. Conduits and wiring shall not be installed within air ducts and plenums other than ceiling return-air plenums.

3.3 EXCAVATION AND BACKFILLING

- A. Refer to Division 31.
- B. Provide all excavation and backfilling required to complete the installation of the electrical system.
- C. Bed all conduit and structures on a 6" thick compacted layer of granular material. Should unsatisfactory soil conditions be discovered, the Architect will inspect the excavation and determine the necessary additional support required.
- D. Backfill around conduit and structures by hand using coarse sand, pit run gravel or the native material if it is similar to the above. Remove all large stones, frozen lumps, perishable rubbish and excessive amounts of clay. Carefully compact this material in 6" layers to a depth of 8" above the conduit, cable or duct. Compact to not less than 90% outside the building and 95% within the building limits of maximum density given by ASTM D698 - 70T (Standard Proctor Density). Architect reserves the right to require soil compaction tests in any areas which do not appear to be compacted properly with the cost of the test paid by the Contractor.
- E. Replace all existing surface improvements (ie. street pavement, curbs, sidewalks, finish sodding, etc.) removed or damaged in the course of the work unless such improvements are to be reconstructed under the general contract. Make all necessary arrangements to perform such repairs, pay all costs in connection therewith and include them in the bid.

3.4 PROTECTION

- A. Contractor shall be responsible for damage of electrical equipment or materials and shall keep clean materials installed by Contractor until final acceptance of the entire building by the Owner. Contractor shall touch-up equipment with chips or scratch marks.
- B. When a portion of the building is to be occupied by the Owner prior to Substantial Completion of the entire Project, arrangements will be made to transfer responsibility for protection and housekeeping tasks from the Contractor to the Owner.
- C. There shall be no interruptions of building systems during occupied times without prior arrangement.
- D. Cover openings and equipment, where set, to prevent obstruction to conduits, breakage, misuse, or disfigurement of equipment. Cover openings in equipment immediately upon uncrating or receipt at the job site and keep covered until permanent connection is made.

3.5 FIRESTOPPING AND SEALANT

- A. Refer to Division 07.
- B. Provide firestopping around all penetrations, sleeves and openings through all partitions, walls and floors.
- C. Provide sealant around electrical conduits penetrating exterior walls, sound rated partitions, or vapor-tight assemblies. Coordinate with requirements in Division 07.

- D. Provide National Recognized Testing Laboratory (UL, ETL, Intertek, or other) listed components installed by certified and factory trained personnel.

3.6 CLEANING

- A. Keep the premises free from accumulations of waste materials or rubbish caused by execution of the work. At the completion of the work, remove rubbish, tools, scaffolding and surplus materials from and about the premises. The premises shall be broom-cleaned or its equivalent, unless more exactly specified. In case of dispute, the Owner may remove the rubbish and charge the cost to the Contractor as the Engineer shall determine to be just.
- B. After tests have been made and accepted clean luminaires, panels and other equipment installed by the Contractor, leaving the entire work area in a clean and complete working order.

3.7 PAINTING

- A. Refinish equipment damaged during shipping or installation to its original condition. Remove rust, prime and paint per manufacturer's recommendations for finish equal to original. Do not paint nameplates, labels, tags, stainless steel or items such as shafts, levels, handles, trim or terminal strips.

3.8 CONTRACTOR WORK

- A. If work does not proceed in a timely manner in the opinion of the Owner and Engineer, the Owner reserves the right to bring in other Contractors to complete specific areas of work. The cost for this work will be deducted from this contract.

END OF SECTION 26 05 00

SECTION 26 05 05 - DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electrical demolition.
- B. Disposal of materials.
- C. Storage of removed materials.
- D. Protection of items to remain as indicated on drawings.
- E. Relocate existing equipment to accommodate construction.
- F. Include minor items, which are obviously and reasonably necessary to complete the installation and usually included in similar work even though not specifically mentioned in the Contract Documents.

1.2 RELATED REQUIREMENTS

- A. Division 01: Additional requirements for alterations work.
- B. Division 02: Removal of equipment and materials containing substances regulated under the Federal Toxic Substances Control Act (TSCA), including but not limited to those containing PCBs and mercury.

1.3 DEFINITIONS

- A. Demolish: Perform all of the requirements of this specification and drawings in regard to demolition including but not limited to:
 - 1. Disconnecting circuit(s) as required.
 - 2. Maintaining existing to remain systems.
 - 3. Protection of items to remain.
 - 4. Circuit detection.
 - 5. Removing conduit, cabling, wiring, supports, junction boxes, etc... back to the source.
 - 6. Patching and painting.
 - 7. Covering and sealing openings.
 - 8. Salvaging items designated by the Owner.
 - 9. Cleaning and repair.
 - 10. Preserving integrity of fire, smoke, water, and acoustic ratings.
 - 11. Updating panel directories.
 - 12. Programming to remove devices from monitoring and operation (fire alarm, lighting controls, etc....).
 - 13. Replacement of items that were not supposed to be demolished or that were damaged.
 - 14. Storage of materials.
 - 15. Transport and disposal of items.

- B. Remove: Same as Demolish.

1.4 SCHEDULING

- A. Schedule work to coincide with new construction.
- B. Perform noisy, malodorous, or dusty work.
 - 1. Between hours of 7 AM and 8 PM (or as directed in Division 01 and front-end).
 - 2. Coordinate with General Contractor and Owner.
- C. Cease operations immediately when structure appears to be in danger and notify General Contractor and Owner. Do not resume operations until directed.

1.5 COORDINATION

- A. Section Specifying - Administrative Requirements: Requirements for coordination.
- B. Conduct demolition to minimize interference with adjacent and occupied building areas.
- C. Coordinate demolition work with Other Contractors, General Contractor, and Owner.
- D. Coordinate and sequence demolition so as not to cause shutdown of operation of adjacent areas.
- E. Shut-down Periods:
 - 1. Arrange timing of shutdown periods of in service panels with Owner. Do not shutdown any utility without prior written approval submitted 14 days prior to shutdown.
 - 2. Keep shutdown period to a minimum of four hours or use intermittent period as directed by Owner.
 - 3. Maintain life safety systems in full operation in occupied facilities or provide written notice a minimum of seven days in advance of outage.
- F. Identify salvage items in cooperation with Owner.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in other sections.
- B. Perform testing using test equipment specifically designed to safely test live circuits.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify any field measurements and circuiting arrangements shown on Drawings. Demolition drawings are based on casual field observations and existing record documents. Report discrepancies to Architect before disturbing existing installation.

- B. Consider minor circuit modifications and rerouting as included in the scope of this project. Major concealed conditions in which the contractor could not anticipate the effort level required shall be brought promptly to the engineer's attention. If the contractor will request a change in the contract amount or contract time due to condition, then the contractor shall submit digital photographs of the existing conditions with a proposed resolution. Failure to do so implies the contractor has assumed the work effort to be included in their bid. Engineer will promptly review information and make recommendations to the owner in an attempt to maintain construction schedule.
- C. Verify that abandoned wiring and equipment serve only abandoned facilities.
- D. Demolition drawings are based on casual field observation and existing record documents.
- E. Report discrepancies to Architect before disturbing existing installation.
- F. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- C. Erect and maintain temporary safeguards, including warning signs and lights, barricades, and similar measures, for protection of the public, Owner, Contractors' employees, and existing improvements to remain.
- D. Provide temporary egress signage and emergency lighting.
- E. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
 - 1. Obtain permission from Owner at least 48 hours before partially or completely disabling system.
 - 2. Make temporary connections to maintain service in areas adjacent to work area.
- F. Existing Data/Telephone/Telecom System: Maintain existing system in service throughout construction. Disable system only to make switchovers and connections. Minimize outage duration.
 - 1. Notify Owner at least 48 hours before partially or completely disabling system.
 - 2. Notify data and telephone utility company at least 24 hours before partially or completely disabling system.
 - 3. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
 - 1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
 - 2. PCB- and DEHP-containing lighting ballasts.
 - 3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
 - 4. Batteries.
 - 5. Detectors/sensors with radioactive materials (ionization-type).
- B. Disconnect or shutoff service to areas where electrical work is to be removed.
- C. Remove, relocate, and extend existing installations (including conduit, wiring, boxes, and fastening devices) to accommodate new construction.
- D. Remove abandoned wiring to source of supply.
- E. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- F. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components, including abandoned components above accessible ceiling finish. Cut embedded support elements flush with walls and floors. Patch all surfaces.
- G. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
 - 1. Receptacles - Demolish conduit, control wiring, and power wiring back to the nearest remaining circuiting junction box or light fixture. If device is the last remaining item on a circuit then demolish back to the panelboard.
- H. Disconnect and remove abandoned panelboards and distribution equipment.
 - 1. Equipment (panelboards, transformers, etc...) - Demolish conduit and wiring back to the switchboard or panelboard serving the device unless noted otherwise.
- I. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
 - 1. Equipment (VFDs, disconnects, motors, starters, panelboards, etc...) - Demolish conduit and wiring back to the switchboard or panelboard serving the device unless noted otherwise.
- J. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

1. Luminaire - Demolish conduit, control wiring, and power wiring back to the nearest remaining circuiting junction box or light fixture. If device is the last remaining item on a circuit then demolish back to the panelboard.
 2. Contractor shall pay for, and provide documentation, that the following items that have been identified as hazardous have been properly disposed of:
 - a. Fluorescent and HID Lamps.
 - b. Ballasts Containing PCBs.
 - c. Electrical Equipment containing PCBs.
- K. Where multi-wire circuits with shared neutrals have existing branch wiring to remain, provide multi-pole circuit breaker(s) or replace wiring to include dedicated neutrals.
- L. Repair adjacent construction and finishes damaged during demolition and extension work.
 1. Replace ceiling tiles damaged during construction.
 2. Patch, paint, and restore finishes of walls, ceilings, floors damaged during construction.
- M. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- N. Where concealed conduits are uncovered within existing construction, reroute as required.
- O. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.
- P. Existing work altered during the course of remodeling shall be placed in safe operating condition and shall remain in service, unless otherwise noted.
- Q. Existing conductors that have been removed shall not be reinstalled.
- R. Wherever devices or equipment are removed from boxes remaining in walls or ceilings, provide blank plates as required. Where clocks or speakers are removed, provide suitable cover plates over the entire opening. Cover plates may be stamped and painted metal to match surrounding surfaces. All covers shall be acceptable to Owner.
- S. Reconnect equipment being disturbed by renovation work and required for continued service to temporary panel or nearest available panel.
- T. Remove electrical luminaires, equipment, and related switches, outlets, conduit and wiring back to source which are not part of the final project.
- U. Install temporary wiring and connections to maintain existing systems in service during construction.
- V. Equipment and circuits shall be de-energized prior to work. No work shall be performed on energized equipment or circuits.
- W. Repair adjacent construction and finishes damaged during demolition and extension work.
- X. Protect and retain power to existing active equipment remaining.

- Y. Cap empty conduit to remain at both ends.
- Z. Remove, relocate and/or reroute existing work as required for the installation of construction.
 - 1. Materials and equipment removed shall be shown to and inspected by the Owner. This shall include items scheduled or noted as being reused, salvaged, or demolished. Those materials and equipment not claimed by the Owner shall be removed from the site and shall be disposed of properly.
 - 2. Dust, dirt, noise and vibration from the work shall be controlled as required by the Owner to prevent damage to other facility systems or interfere with Owner occupancy.
 - 3. Provide plastic sheet temporary carrier walls around work where not provided by the Other Contractors.
 - 4. Review and coordinate work with the demolition and abatement (where applicable) contractors.
- AA. It shall be each subcontractor's sole responsibility for proper demolition of existing electrical systems including but not limited to the following. Under no circumstances shall improper demolition or cut cabling or damaged devices be the responsibility of the Owner. Any cabling or devices damaged that are outside the area of demolition or serving areas outside the area of demolition shall be replaced with new cabling/devices (not spliced, reinstalled, or relocated). Any cabling or devices demolished that are outside the area of demolition shall be replaced with new cabling/devices (not spliced, reinstalled, or relocated). Systems include but are not limited to the following:
 - 1. Electrical lighting & power systems - Electrical contractor
- BB. Contractor shall furnish all labor and materials needed to preserve the fire, smoke, and water containment ratings and integrity of floors, walls, ceilings, and partitions. In existing walls being changed in fire rating, provide firestopping to existing cabling, conduit, and other items in order to provide fire rating as per the code plans.
- CC. Identify and provide new supporting means for existing electrical equipment such as low voltage cabling, conduits, boxes, pullboxes, conduit bodies, and conduit racks that will need additional support due to the demolition of the existing supports, including ceilings or ceiling supports.
- DD. Maintain electrical service system throughout construction in service until new service is complete and ready for service. Disable system only to make switchovers and connections. Notify and obtain permission from Owner and Engineer at least 24 hours before partially or fully disabling the system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- EE. For any phased construction to occur during occupancy periods, provide temporary arrangements (cabinets, panelboards, etc...) for telecom cabling, paging system, fire alarm system, power cabling, etc... for any area not being remodeled in order that remodel work does not affect the areas remaining to be utilized for occupancy functions. Provide all temporary construction as required for occupancy including but not limited to:
 - 1. Temporary LED strip lighting for use in temporary hallways or spaces that will be occupied by non-construction staff.
 - 2. Exit lighting as required for shifting construction conditions for regular occupants.

3. Egress lighting as required for shifting construction conditions for regular occupants.
 4. Fire Alarm devices as required for shifting construction conditions for regular occupants.
 5. Security cameras and other security functions as required for shifting construction conditions for regular occupants.
- FF. If the building is occupied during construction, the Contractor shall schedule work and carry it out in such a manner as to least inconvenience the occupants due to interruptions of systems (power, lighting, fire alarm, security, phone/data, technology, etc...). Interruptions shall be confined to the smallest possible area at any one time and all interruptions shall be approved by the Owner and coordinated with all the trades. The normal use of the facility shall not be disturbed, except within the immediate construction area phased as decided between the Owner and Engineer. Walks, driveways, and entrances shall be kept clear and free of Contractor's equipment, materials, and debris. All materials and equipment shall be stored in such a place and such a manner that a minimum of congestion will result. The placing of such materials and equipment shall be subject to the approval of the Owner.
- GG. Do not reuse materials (conduit, cabling, wiring, devices, supports, equipment, etc...) unless specifically indicated or approved by the Engineer. All conduit, pathways, and wiring shall be new unless specifically indicated as "existing to remain" or "existing to be reused".
- HH. No portion of demolished electrical circuits, cabling, wiring, conduit, or equipment may be abandoned in place.

3.4 EXISTING PANELBOARDS/SWITCHBOARDS

- A. Ring/trace out circuits in existing panelboards & switchboards affected by the work. Determine which panel and circuit breaker feeds each load/outlet in existing panelboards that have additional or demolished circuits/loads to the panelboard/switchboard.
1. Where additional circuits are needed and existing circuit breakers are available, reuse spare circuit breakers.
 2. Where additional circuits are needed and existing circuit breakers are not available, provide new circuit breakers within prepared spaces (extend bus if required). Adjust existing circuit breaker arrangement if needed to combine spaces for two or three pole circuit breakers. Contractor shall provide circuit breakers or fused switches of the same manufacturer, AIC rating, and same type as existing.
 3. Provide new typed panelboard directory inside panelboard door.
 4. It is not the intent of this section to identify the actual routing of the building wiring or conduit, unless it is necessary to do so in order to identify the circuits.
 5. Provide a new switchboard/panelboard directory (and retain the old one) indicating all room numbers and type of branch circuit (example: "Receptacles Rms 2014, 2015, 2016").
 6. Provide circuit number labels if they are absent from the existing switchboard/panelboard.
- B. Where a panelboard does not have space to accommodate additional over current protective devices, provide a fused switch, near panel, and tap circuit into panelboard bussing.
- C. Tag unused circuits as spares.

- D. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding project area or not in use.
- E. Remove existing wire no longer in use from panel to equipment.
- F. Provide new updated panelboard directories where any circuits have been modified or rewired.

3.5 SALVAGE ITEMS

- A. Remove and protect items indicated on drawings and/or in Schedule to be salvaged and turnover to Owner. Obtain receipt from Owner as to quantity and type of items salvaged and given to Owner.
- B. Items of salvageable value may be removed as work progresses. Transport salvaged items from site as they are removed to location designated by Owner.
- C. Owner may salvage some equipment and materials from the building that are part of system scheduled for demolition.
- D. Owner shall have the opportunity to access and perform the salvage work prior to the contractor's demolition or during demolition work.
- E. Those materials and equipment not claimed by the Owner shall be removed from the site and shall be disposed of properly.

3.6 REUSABLE ELECTRICAL EQUIPMENT

- A. Carefully remove equipment, materials, or luminaires which are to be used.
- B. Disconnect, remove, or relocate existing electrical material and equipment interfering with new installation.
- C. Relocate existing luminaires as indicated on Drawings. Clean luminaires and re-lamp. Test luminaire to verify it is in good working condition before installation at new location.
- D. Those materials and equipment not claimed by the Owner shall be removed from the site and shall be disposed of properly.

3.7 CLEANING AND REPAIR

- A. See Division 01 for additional construction waste management and disposal requirements.
- B. Clean and repair existing materials and equipment that remain or that are to be reused.
- C. Clean and repair existing equipment to be reinstalled.
- D. Clean and repair existing equipment that is affected by demolition.
- E. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit

directory showing revised circuiting arrangement.

- F. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace drivers, controls, lamps, ballasts and broken electrical parts.

END OF SECTION 26 05 05

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Single conductor building wire.
- B. Wiring Accessories
 - 1. Wiring connectors.
 - 2. Electrical tape.
 - 3. Heat shrink tubing.
 - 4. Wire pulling lubricant.
 - 5. Cable ties.

1.2 RELATED REQUIREMENTS

- A. Division 07 - Firestopping.
- B. Section 26 05 05 - Demolition for Electrical: Disconnection, removal, and/or extension of existing electrical conductors and cables.
- C. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- D. Section 26 05 33.13 - Conduit for Electrical Systems: For pathways and for flexible metal conduit pre-manufactured whips to be used for final connections from junction boxes to luminaires.
- E. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 05 73 - Power System Studies: Wire sizing increases due to selective coordination.
- G. Section 26 27 33 - Power Distribution Units: For pre-manufactured branch circuit assemblies to be used for power connections from a PDU to outlets under a raised access floor.
- H. Division 31 - Excavation, bedding, and backfilling.

1.3 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).

- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- G. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.
- H. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
- K. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
- L. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Current Edition, Including All Revisions.
- M. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
- N. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
- O. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.
- P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop and other derating.
 - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.

1.5 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.7 FIELD CONDITIONS

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F (-10 degrees C), unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.1 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Direct-Buried Underground feeder and branch-circuit cable is not permitted.
- E. Armored cable is not permitted.
- F. Metal-clad cable is not permitted.
- G. Manufactured wiring systems are not permitted.

2.2 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Provide new conductors and cables manufactured not more than one year prior to installation.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

- G. Conductors for Grounding and Bonding: Also comply with Section 26 05 26.
- H. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.
- I. Minimum Conductor Size:
 - 1. Branch Circuits: 12 AWG.
 - a. Exceptions:
 - 1) 20 A, 120 V circuits longer than 75 feet (23 m): 10 AWG, for voltage drop.
 - 2) 20 A, 120 V circuits longer than 150 feet (46 m): 8 AWG, for voltage drop.
 - 2. Control Circuits: 14 AWG.
- J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- K. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.
 - a. Conductors of all sizes shall be integral continuous color coded conductors.
 - 3. Color Code:
 - a. 480Y/277 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral/Grounded: Gray.
 - b. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - c. Equipment Ground, All Systems: Green.
 - 1) (+): Violet
 - 2) (-): Gray
 - d. For control circuits, comply with manufacturer's recommended color code.

2.3 SINGLE CONDUCTOR BUILDING WIRE

- A. Manufacturers:
 - 1. Copper Building Wire:

- a. Alan Wire Company: www.alanwire.com
- b. Cerro Wire LLC: www.cerrowire.com
- c. Encore Wire Corporation: www.encorewire.com
- d. General Cable Corporation: www.generalcable.com
- e. Service Wire Co: www.servicewire.com
- f. Southwire Company: www.southwire.com

B. Description: Single conductor insulated wire.

C. Conductor Stranding:

- 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller (all other): Solid.
 - b. Size 8 AWG and Larger (all): Stranded.
- 2. Control Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:

- 1. Copper Building Wire: Type THHN/THWN, THHN/THWN-2, or XHHW-2, except as indicated below.
 - a. Size 4 AWG and Larger: Type XHHW-2.
 - b. Installed Underground, concealed in concrete, or below Slabs-on-Grade: Type THWN-2 or XHHW-2.

2.4 CONTROLS CABLING

A. Class 1 Control Circuits: Type THHN-THWN in raceway.

B. Class 2 Control Circuits: Type THHN-THWN, Power-limited (CL2) cable concealed in building finishes, and Power-limited plenum rated CL2P cable in cable support system similar to Division 27.

2.5 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.

C. Wiring Connectors for Splices and Taps:

- 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
- 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

D. Wiring Connectors for Terminations:

- 1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.

2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
 3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
 4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
 5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
 6. Stranded Conductors Size 10 AWG and Smaller: Use compression type connectors or crimped terminals for connections to terminal screws. Stranded conductors under a plain screw is not allowed.
 7. Conductors for Control Circuits: Use crimped terminals for all connections.
- E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
- F. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F (105 degrees C) for standard applications and 302 degrees F (150 degrees C) for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
1. Manufacturers:
 - a. 3M: www.3m.com
 - b. Ideal Industries, Inc: www.idealindustries.com
 - c. NSI Industries LLC: www.nsiindustries.com
 - d. Or Approved Equal.
- G. Mechanical Connectors: Provide bolted type or set-screw type.
1. Manufacturers:
 - a. Burndy LLC: www.burndy.com
 - b. IlSCO: www.ilSCO.com
 - c. Thomas & Betts Corporation: www.tnb.com
- H. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
1. Hydraulic crimping tool dies shall impress the die's conductor size range into the crimp.
 2. Manufacturers:
 - a. Burndy LLC: www.burndy.com
 - b. IlSCO: www.ilSCO.com
 - c. Thomas & Betts Corporation: www.tnb.com
 - d. Or Approved Equal.

2.6 ACCESSORIES

- A. Electrical Tape:
1. Manufacturers:
 - a. 3M: www.3m.com
 - b. Plymouth Rubber Europa: www.plymouthrubber.com

2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
 3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 8.5 mil (0.21 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
 4. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil (2.3 mm).
- B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
1. Manufacturers:
 - a. 3M: www.3m.com
 - b. Burndy LLC: www.burndy.com
 - c. Thomas & Betts Corporation: www.tnb.com
- C. Wire Pulling Lubricant:
1. Manufacturers:
 - a. 3M: www.3m.com
 - b. American Polywater Corporation: www.polywater.com
 - c. Ideal Industries, Inc: www.idealindustries.com
 2. Listed and labeled as complying with UL 267.
 3. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
 4. Suitable for use at installation temperature.
- D. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.3 INSTALLATION

- A. Circuiting Requirements:
 - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 - 2. When circuit destination is indicated determine exact routing required.
 - 3. Arrange circuiting to minimize splices.
 - 4. Include circuit lengths required to install connected devices within 10 ft (3.0 m) of location indicated.
 - 5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
 - 1) Are required as per the selective coordination requirements of this section.
 - (a) All selective coordination required modifications shall be completed at no additional cost to the Owner. This includes but is not limited to:
 - (1) Increased conduit and feeder sizes due to increased overcurrent protective device sizes.
 - 6. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Route raceways parallel or perpendicular to building structural members and surfaces.
 - 5. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
- G. Terminate cables using suitable fittings.
- H. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

- I. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet (1.5 m) of slack.
- J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- K. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- L. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminants. Do not use wire brush on plated connector surfaces.
 - 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 6. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- M. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
 - 1. Damp Locations: Use insulating covers specifically designed for the connectors or heat shrink tubing.
 - a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
 - b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.
 - 2. Wet Locations: Use heat shrink tubing.
- N. Insulate ends of spare conductors using vinyl insulating electrical tape.
- O. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.
- P. Identify conductors and cables in accordance with Section 26 05 53.
- Q. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07.
- R. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.4 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.
- D. Ground rod electrodes.

1.2 REFERENCE STANDARDS

- A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2022.
- D. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70 and IEEE 81.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

- A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
- B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 - 1. Ground Rod Electrode(s):
 - a. Provide three electrodes in an equilateral triangle configuration unless otherwise indicated or required.
 - b. Space electrodes not less than 10 feet (3.0 m) from each other and any other ground electrode.
 - c. Where location is not indicated, locate electrode(s) at least 5 feet (1.5 m) outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
- E. Bonding and Equipment Grounding:
 - 1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
 - 2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
 - 3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
 - 4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
 - 5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.

2.2 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
 - 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
 - 1. Use insulated copper conductors unless otherwise indicated.

2. Factory Pre-fabricated Bonding Jumpers: Furnished with factory-installed ferrules; size braided cables to provide equivalent gauge of specified conductors.
- C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 2. Unless otherwise indicated, use exothermic welded connections for underground, concealed, outdoors, and other inaccessible connections.
 3. Unless otherwise indicated, use mechanical connectors or compression connectors for accessible connections indoors.
 4. Manufacturers - Mechanical and Compression Connectors:
 - a. Advanced Lightning Technology (ALT): www.altfab.com
 - b. Burndy LLC: www.burndy.com
 - c. Harger Lightning & Grounding: www.harger.com
 - d. nVent ERICO: www.nvent.com
 - e. Thomas & Betts Corporation: www.tnb.com
 - f. Or Approved Equal.
- D. Ground Rod Electrodes:
1. Comply with NEMA GR 1.
 2. Material: Copper-bonded (copper-clad) steel.
 3. Size: 3/4 inch (19 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.
 4. Manufacturers:
 - a. Advanced Lightning Technology (ALT): www.altfab.com
 - b. Galvan Industries, Inc: www.galvanelectrical.com
 - c. Harger Lightning & Grounding: www.harger.com
 - d. nVent ERICO: www.nvent.com
 - e. Or Approved Equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury

- horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.
1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches (150 mm) below finished grade.
- D. Make grounding and bonding connections using specified connectors.
1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 3. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 4. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- E. Identify grounding and bonding system components in accordance with Section 26 05 53.
- F. Inspect and test in accordance with NETA ATS except Section 4.
- G. Perform inspections and tests listed in NETA ATS, Section 7.13.
- H. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
- I. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.
- J. Include all ground electrode locations on as-built documentation. Provide GPS coordinates for items installed within the site.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.2 REFERENCE STANDARDS

- A. MFMA-4 - Metal Framing Standards Publication; 2004.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes and arrangement of supports and bases with actual equipment and components to be installed.
2. Coordinate work to provide additional framing and materials required for installation.
3. Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.
4. Coordinate arrangement of supports with ductwork, piping, equipment and other potential conflicts.
5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1.4 QUALITY ASSURANCE

- A. Installer Qualifications for Field-Welding: As specified in Division 05.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:

1. Comply with the following. Where requirements differ, comply with most stringent.
 - a. NFPA 70.
 - b. Requirements of authorities having jurisdiction.
2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.

4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
 - a. Cable type or aircraft cable type supports (Gripple or similar) shall not be permitted.
 6. Materials:
 - a. Comply with MFMA-4 for all coatings.
 - b. Fiberglass: Manufacturer's standard fiberglass applicable to installation environment.
 - 1) Components strut shall conform to the requirements of ASTM D4385 for Levels III and IV.
- B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.
- C. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.
- D. Anchors and Fasteners:
1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.
 2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
 3. Plastic and lead anchors are not permitted.
 4. Powder-actuated fasteners are not permitted.
 5. Hammer-driven anchors and fasteners are not permitted.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install hangers and supports in accordance with NECA 1.
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- D. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.
- E. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

- G. Equipment Support and Attachment:
 - 1. Use fiberglass channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
- H. Conduit Support and Attachment: See Section 26 05 33.13 for additional requirements.
- I. Box Support and Attachment: See Section 26 05 33.16 for additional requirements.
- J. Secure fasteners in accordance with manufacturer's recommended torque settings.
- K. Remove temporary supports.
- L. Identify independent electrical component support wires above accessible ceilings, where permitted, with color distinguishable from ceiling support wires in accordance with NFPA 70.

3.3 FIELD QUALITY CONTROL

- A. Inspect support and attachment components for damage and defects.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 26 05 29

SECTION 26 05 33.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Galvanized steel rigid metal conduit (RMC).
- B. Liquidtight flexible metal conduit (LFMC).
- C. Rigid polyvinyl chloride (PVC) conduit.

1.2 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.
- B. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).
- C. ASTM D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics; 2017 (Reapproved 2023).
- D. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- F. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.
- G. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2017.
- H. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- I. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.
- J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
- L. UL 360 - Liquid-Tight Flexible Metal Conduit; Current Edition, Including All Revisions.
- M. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
- N. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

1.4 QUALITY ASSURANCE

1.5 DELIVERY, STORAGE, AND HANDLING

- #### A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 CONDUIT APPLICATIONS

- #### A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- #### B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.
- #### C. Underground:
1. Exterior, Direct-Buried: Use rigid PVC conduit.
 2. Exterior, Embedded Within Concrete: Use rigid PVC conduit.
 3. Where rigid polyvinyl chloride (PVC) conduit is provided, transition to galvanized steel rigid metal conduit (RMC) where emerging from underground.
 4. Where rigid polyvinyl (PVC) conduit is provided, use rigid PVC for bends.
- #### D. Embedded Within Concrete:
1. Within Slab on Grade: Not permitted.
 2. Within Slab Above Ground: Use galvanized steel rigid metal conduit.
 3. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit (RMC) where emerging from concrete.

- E. Exposed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit (RMC).
- F. Flexible Connections to Vibrating Equipment:
 - 1. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit (LFMC).
 - 2. Maximum Length: 6 feet (1.8 m) unless otherwise indicated.
 - 3. Vibrating equipment includes, but is not limited to:
 - a. Motors.

2.2 CONDUIT - GENERAL REQUIREMENTS

- A. Comply with NFPA 70.
- B. Fittings for Grounding and Bonding: See Section 26 05 26 for additional requirements.
- C. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- D. Provide products listed, classified, and labeled as suitable for purpose intended.
- E. Minimum Conduit Size, Unless Otherwise Indicated:
 - 1. Branch Circuits: 1-1/4 inch trade size.
 - 2. Lighting Circuits: 1-inch (27 mm) trade size.
 - 3. Control Circuits: 1/2-inch (16 mm) trade size.
 - 4. Underground, Exterior: 1-1/4 inch trade size.
- F. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Manufacturers:
 - 1. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.com
 - 2. Nucor Tubular Products: www.nucortubular.com
 - 3. Western Tube, a division of Zekelman Industries: www.westerntube.com
 - 4. Wheatland Tube, a division of Zekelman Industries: www.wheatland.com
- B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- C. Fittings:
 - 1. Manufacturers:
 - a. Bridgeport Fittings Inc; FRB Series: www.bptfittings.com.
 - b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com
 - c. Thomas & Betts Corporation: www.tnb.com
 - d. Or same as manufacturer of conduit or boxes to be connected.
 - 2. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.

3. Material: Use steel or malleable iron.
 - a. Do not use die cast zinc fittings.
4. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Manufacturers:
 1. AFC Cable Systems, Inc: www.afcweb.com
 2. Electri-Flex Company: www.electriflex.com
 3. International Metal Hose: www.metalhose.com
- B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
- C. Fittings:
 1. Manufacturers:
 - a. Bridgeport Fittings Inc: www.bptfittings.com
 - b. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com
 - c. Thomas & Betts Corporation: www.tnb.com
 - d. Or same as manufacturer of conduit or boxes to be connected.
 2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 3. Material: Use steel or malleable iron.
 - a. Do not use die cast zinc fittings.

2.5 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

- A. Manufacturers:
 1. Cantex Inc: www.cantexinc.com
 2. Carlon, a brand of Thomas & Betts Corporation: www.carlon.com
 3. JM Eagle: www.jmeagle.com
- B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
- C. Fittings:
 1. Manufacturer: Same as manufacturer of conduit or boxes to be connected.
 2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.6 ACCESSORIES

- A. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.

- B. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf (5.6 kN).
- C. Duct Seals for Conduit Penetrations: Suitable for the conduits to be installed.
 - 1. Duct seal shall be used to seal around annular space between cabling installed in a conduit and the inside wall of the conduit.
 - 2. 2-part, 98% closed-cell urethane foam (NOT putty/compound based).
 - 3. Sealant shall be capable of sealing 3/4" conduits up to 10" conduits with multiple cable configurations.
 - 4. Sealant system shall be re-enterable.
 - 5. Operating Temperatures: -40 degrees F to 200 degrees F
 - 6. Chemically resistant to gasoline, oils, dilute acids, and bases.
 - 7. Sealant shall not affect the physical or electrical properties of the wire, cable, or cable installation.
 - 8. Sealant shall adhere to all duct/conduit, and cable jacket surfaces.
 - 9. Compressive Strength: 120 psi minimum as per ASTM D1621.
 - 10. Tensile Strength: 270 psi minimum as per ASTM D1623.
 - 11. Flexural Strength: 460 psi minimum as per ASTM D790.
 - 12. Water Pressure Continuous: 22 ft water head minimum.
 - 13. Water Pressure Short Term: 90 ft water head minimum.
 - 14. Gas Pressure Continuous: 5 psig minimum.
 - 15. Basis of Design Product: American Polywater Corporation; FST Foam Sealant.
 - a. Or Equal by:
 - 1) 3M: www.3m.com
 - 2) Advanced Products and Systems, Inc.: www.apsonline.com
 - 3) GPT; an EnPro Industries company: www.gptindustries.com
 - 4) Holdrite; Reliance Worldwide Corporation: www.holdrite.com
 - 5) Metraflex: www.metraflex.com
 - 6) Rainbow Technology Corporation: www.rainbowtech.com
 - 7) RectorSeal: www.rectorseal.com
 - 8) Roxtec: www.roxtec.com

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.

- B. Install conduit in accordance with NECA 1.
- C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.
- D. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.
- E. Conduit Routing:
 - 1. When conduit destination is indicated without specific routing, determine exact routing required.
 - 2. Conceal conduits within structures as manufacturers allow.
 - 3. Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
 - 4. Arrange conduit to maintain adequate headroom, clearances, and access.
 - 5. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.
 - 6. Arrange conduit to provide no more than 150 feet (46 m) between pull points.
 - 7. Route conduits above water and drain piping where possible.
 - 8. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
 - 9. Maintain minimum clearance of 6 inches (150 mm) between conduits and piping for other systems.
 - 10. Group parallel conduits in same area on common rack.
- F. Conduit Support:
 - 1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 26 05 29.
 - 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 - 3. Use conduit strap to support single surface-mounted conduit.
 - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
 - 4. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
 - 5. Use of spring steel conduit clips for support of conduits is not permitted.
 - 6. Use of wire for support of conduits is not permitted.
 - 7. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with most stringent requirements.
- G. Connections and Terminations:
 - 1. Use approved zinc-rich paint on field-cut threads of galvanized steel conduits prior to making connections.
 - 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
 - 3. Use suitable adapters where required to transition from one type of conduit to another.

4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
 5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 6. Where spare conduits stub up through concrete floors and are not terminated in box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
 7. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
 8. Secure joints and connections to provide mechanical strength and electrical continuity.
- H. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 4. Conceal bends for conduit risers emerging above ground.
 5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases. Seal with duct seal.
 6. Slope conduits away from building when penetrating through an exterior wall.
 7. Provide suitable duct seal where conduits penetrate exterior wall below grade.
 8. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
 9. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.
 10. Provide cover/finishes around conduit penetrations that are exposed to public view. Visible gaps in wall or opening are not acceptable.
 - a. Provide metal escutcheon plate cover for conduit penetrations through any other type of finish.
- I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
 3. Where conduits are subject to earth movement by settlement or frost.
- J. Conduit Sealing:
1. Use link seals to prevent entry of moisture and gases. This includes, but is not limited to:
 - a. Where conduits enter building from outside.
 - b. Where service conduits enter building from underground distribution system.
 - c. Where conduits enter building from underground.

d. Where conduits may transport moisture to contact live parts.

K. Provide pull string in each empty conduit and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches (300 mm) at each end.

L. Provide grounding and bonding; see Section 26 05 26.

M. Identify conduits; see Section 26 05 53.

3.3 FIELD QUALITY CONTROL

A. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

B. Correct deficiencies and replace damaged or defective conduits.

3.4 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.5 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION 26 05 33.13

SECTION 26 05 33.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Outlet and device boxes up to 100 cubic inches (1,650 cu cm), including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches (1,650 cu cm).
- C. Underground boxes/enclosures (aka handholes).
- D. Accessories.

1.2 RELATED REQUIREMENTS

- A. Division 03 - Concrete
- B. Division 07 - Firestopping
- C. Division 08 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
- D. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- E. Section 26 05 29 - Hangers and Supports for Electrical Systems.
- F. Section 26 05 33.13 - Conduit for Electrical Systems:
 - 1. Conduit bodies and other fittings.
 - 2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
 - 3. Accessory boxes designed specifically for surface raceway systems.
- G. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
- H. Section 26 27 26 - Wiring Devices:
 - 1. Wall plates.
 - 2. Additional requirements for locating boxes for wiring devices.
- I. Section 26 28 13 - Fuses: Spare fuse cabinets.

1.3 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

- D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. SCTE 77 - Specifications for Underground Enclosure Integrity; 2023.
- H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- J. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.
- K. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
 - 4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
 - 5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
 - 6. Coordinate the work with other trades to preserve insulation integrity.
 - 7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
 - 8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 BOXES

A. General Requirements:

1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:

1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit is used.
4. Use suitable concrete type boxes where flush-mounted in concrete.
5. Use suitable masonry type boxes where flush-mounted in masonry walls.
6. Use raised covers suitable for the type of wall construction and device configuration where required.
7. Use shallow boxes where required by the type of wall construction.
8. Do not use "through-wall" boxes designed for access from both sides of wall.
9. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
10. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
11. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
12. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
13. Minimum Box Size, Unless Otherwise Indicated:
 - a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
14. Wall Plates: Comply with Section 26 27 26.
15. Manufacturers:
 - a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com
 - b. Hubbell Incorporated; Bell Products: www.hubbell-rtb.com
 - c. Hubbell Incorporated; RACO Products: www.hubbell-rtb.com

- d. O-Z/Gedney, a brand of Emerson Electric Co: www.emerson.com
 - e. Thomas & Betts Corporation: www.tnb.com
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
- 1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 - 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
 - a. Outdoor Locations: Type 4X, stainless steel.
 - 1) Provide Type 304 for typical corrosive locations.
 - 3. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
 - a. Provide hinged-cover enclosures unless otherwise indicated.
 - b. Boxes 6 square feet (0.56 sq m) and Larger: Provide hinged-cover enclosures.
 - 4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
 - a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
 - b. Back Panels: Painted steel, removable.
 - c. Terminal Blocks: Provide voltage/current ratings and terminal quantity suitable for purpose indicated, with 25 percent spare terminal capacity.
 - 5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated by Architect.
 - 6. Manufacturers:
 - a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com
 - b. Hoffman, a brand of nVent: www.hoffmanonline.com
 - c. Hubbell Incorporated; Wiegmann Products: www.hubbell-wiegmann.com
- D. Underground Boxes/Enclosures:
- 1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
 - 2. Size: 30 by 48 unless otherwise indicated.
 - 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches (300 mm).
 - 4. Provide text & logo on cover to indicate type of service.
 - 5. Applications:
 - a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 8 load rating.
 - b. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
 - 6. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
 - a. Manufacturers:
 - 1) Hubbell Incorporated; Quazite Products: www.hubbellpowersystems.com.
 - 2) MacLean Highline: www.macleanhighline.com.
 - 3) Oldcastle Precast, Inc: www.oldcastleprecast.com.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
 - b. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.

2.2 ACCESSORIES

- A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for boxes and facade materials to be installed.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- E. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- F. Box Locations:
 - 1. Locate boxes to be accessible. Provide access panels in accordance with Division 08 as required where approved by the Architect.
 - 2. Unless dimensioned, box locations indicated are approximate.
 - 3. Locate boxes as required for devices installed under other sections or by others.
 - a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 27 26.
 - 4. Locate boxes so that wall plates do not span different building finishes.
 - 5. Locate boxes so that wall plates do not cross masonry joints.
 - 6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
 - 7. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location.
 - a. Seal junction boxes on the exterior face of the exterior wall/floor/ceiling (building envelope air barrier).
 - 8. Interface with Other Work:

- a. Casework, woodwork, stone veneer walls: Do not install boxes or cut openings for boxes prior to coordination with casework, wood or stone supplier.
 9. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 05 33.13.
- G. Box Supports:
1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
- H. Install boxes plumb and level.
- I. Install boxes as required to preserve insulation integrity.
- J. Underground Boxes/Enclosures:
1. Install enclosure on gravel base, minimum 6 inches (150 mm) deep.
 2. Flush-mount enclosures located in concrete or paved areas.
 3. Mount enclosures located in landscaped areas with top at 1 inch (25 mm) above finished grade.
 4. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.
 5. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
 6. Close unused box openings.
 7. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
 8. Provide grounding and bonding in accordance with Section 26 05 26.
 9. Identify boxes in accordance with Section 26 05 53.

3.3 CLEANING

- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.4 PROTECTION

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION 26 05 33.16

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Wire and cable markers.
- D. Underground warning tape.

1.2 REFERENCE STANDARDS

- A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011 (Reaffirmed 2017).
- B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011 (Reaffirmed 2017).
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2024.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
 - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
 - 2. Do not install identification products until final surface finishes and painting are complete.

1.4 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Verify prior to printing, labeling, ordering, or programming that the room names and room numbers utilized match the actual final installed room names and room numbers. Coordinate with Owner and architect for final room numbering to be utilized.

1.5 FIELD CONDITIONS

- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.1 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:

1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
 - a. Panelboards:
 - 1) Identify ampere rating.
 - 2) Identify voltage and phase. Identify upstream feeder size in the form of the following:
 - (a) 2"C - 4#2/0, 1#6G
 - 3) Identify power source and circuit number. Include location when not within sight of equipment.
 - 4) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
 - 5) Use typewritten circuit directory or panel schedule to identify load(s) served for panelboards with a door. Identify spares and spaces.
 - (a) Verify prior to printing, labeling, ordering, or programming that the room names and room numbers utilized match the actual final installed room names and room numbers. Coordinate with Owner and architect for final room numbering to be utilized.
 - 6) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
 - b. Enclosed switches, circuit breakers, and motor controllers:
 - 1) Identify voltage and phase.
 - 2) Identify power source and circuit number. Include location when not within sight of equipment.
2. Use voltage marker to identify highest voltage present for each piece of electrical equipment.
3. Use identification label on outside of door at each fused switch to identify required NEMA fuse class and size.
4. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
 - a. Minimum Size: 3.5 by 5 inches (89 mm by 127 mm).
 - b. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.
 - c. Service Equipment: Include the following information in accordance with NFPA 70.
 - 1) Nominal system voltage.
 - 2) Available fault current.

- 3) Clearing time of service overcurrent protective device(s).
- 4) Date label applied and date calculations performed.
- d. Provide Arc Flash Hazard Warning Label at every piece of electrical equipment to include the date calculations were performed and all information required by Engineer. Identify as directed by Engineer.

B. Identification for Conductors and Cables:

1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
2. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
 - a. At each source and load connection.
 - b. Within boxes when more than one circuit is present.
 - c. Within equipment enclosures when conductors and cables enter or leave the enclosure.

2.2 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:

1. Manufacturers:
 - a. Brimar Industries, Inc: www.brimar.com
 - b. Kolbi Pipe Marker Co: www.kolbipipemarkers.com
 - c. Seton Identification Products: www.seton.com
2. Materials:
 - a. Outdoor Locations: Use stainless steel nameplates suitable for exterior use.
3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
4. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch (25 mm) high; Four, located at corners for larger sizes.
5. Mechanical Fasteners shall be stainless steel screws.

B. Identification Labels:

1. Manufacturers:
 - a. Brady Corporation: www.bradyid.com.
 - b. Brother International Corporation: www.brother-usa.com
 - c. Panduit Corp: www.panduit.com
2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
 - a. Use only for indoor locations.
3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:

1. Minimum Size: 1 inch (25 mm) by 2.5 inches (64 mm).
2. Legend:
 - a. Equipment designation or other approved description.
 - b. Other information as indicated.

3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height:
 - a. System Designation: 1 inch (25 mm).
 - b. Equipment Designation: 1/2 inch (13 mm).
 - c. Other Information: 1/4 inch (6 mm).
 - d. Exception: Provide minimum text height of 1 inch (25 mm) for equipment located more than 10 feet (3.0 m) above floor or working platform.
5. Color:
 - a. Normal Power System: White text on black background.

2.3 WIRE AND CABLE MARKERS

- A. Manufacturers:
 1. Brady Corporation: www.bradyid.com
 2. HellermannTyton: www.hellermanntyton.com
 3. Panduit Corp: www.panduit.com
- B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl self-laminating type markers suitable for the conductor or cable to be identified.
- C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
- D. Legend: Power source and circuit number or other designation indicated.
- E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
- F. Minimum Text Height: 1/8 inch (3 mm).
- G. Color: Black text on white background unless otherwise indicated.

2.4 UNDERGROUND WARNING TAPE

- A. Manufacturers:
 1. Brady Corporation: www.bradyid.com
 2. Brimar Industries, Inc: www.brimar.com
 3. Seton Identification Products: www.seton.com
- B. Materials: Use foil-backed detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
- C. Foil-backed Detectable Type Tape: 6 inches (152 mm) wide, with minimum thickness of 5 mil (0.1 mm), unless otherwise required for proper detection.
- D. Legend: Type of service, continuously repeated over full length of tape.
- E. Color:
 1. Tape for Buried Power Lines: Black text on red background.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
 - 1. Surface-Mounted Equipment: Enclosure front.
 - 2. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
 - 3. Elevated Equipment: Legible from the floor or working platform.
 - 4. Branch Devices: Adjacent to device.
 - 5. Interior Components: Legible from the point of access.
 - 6. Conductors and Cables: Legible from the point of access.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws.
 - 1. Do not use adhesives on exterior surfaces.
- E. Install underground warning tape above buried lines with one tape per trench at 3 inches (75 mm) below finished grade.

3.3 FIELD QUALITY CONTROL

- A. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION 26 05 53

SECTION 26 24 16 - PANELBOARDS

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
- B. Section 26 05 29 - Hangers and Supports for Electrical Systems.

1.2 REFERENCE STANDARDS

- A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; 2013e, with Amendments (2022).
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- C. NECA 407 - Standard for Installing and Maintaining Panelboards; 2015.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
- E. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 1000 Volts or Less; 2023.
- F. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- J. UL 67 - Panelboards; Current Edition, Including All Revisions.
- K. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.

1.3 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. ABB: www.electrification.us.abb.com/#sle.

- B. Eaton Corporation: www.eaton.com/#sle.
- C. Schneider Electric: www.se.com/#sle.
- D. Siemens Industry, Inc: www.new.siemens.com/#sle.

2.2 PANELBOARDS - GENERAL REQUIREMENTS

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
 - 1. Altitude: Less than 6,600 feet (2,000 m).
 - 2. Ambient Temperature:
- C. Short Circuit Current Rating:
 - 1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
- D. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.
- E. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.
- F. Bussing: Sized in accordance with UL 67 temperature rise requirements.
 - 1. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
- G. Conductor Terminations: Suitable for use with the conductors to be installed.
- H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
 - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Outdoor Locations: Type 3R.
 - 2. Boxes: Galvanized steel unless otherwise indicated.
 - a. Provide wiring gutters sized to accommodate the conductors to be installed.
 - 3. Fronts:
 - a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
 - 4. Lockable Doors: All locks keyed alike unless otherwise indicated.
- I. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

2.3 OVERCURRENT PROTECTIVE DEVICES

- A. Molded Case Circuit Breakers:
 - 1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375

where applicable; ratings, configurations, and features as indicated on the drawings.

2. Interrupting Capacity:
 - a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
 - 1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
 - b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
3. Conductor Terminations:
 - a. Provide mechanical lugs unless otherwise indicated.
 - b. Lug Material: Copper, suitable for terminating copper conductors only.
4. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
 - a. Provide the following field-adjustable trip response settings:
 - 1) Long time delay.
 - 2) Ground fault pickup and delay where ground fault protection is indicated.
5. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.
- D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- E. Provide required support and attachment in accordance with Section 26 05 29.
- F. Install panelboards plumb.
- G. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches (2000 mm) above the floor or working platform.
- H. Mount panelboard such that the lowest position of any operating handle for circuit breakers is above low vents on traffic control enclosure to prevent backsplash.
- I. Provide grounding and bonding in accordance with Section 26 05 26.
- J. Install all field-installed branch devices, components, and accessories.
- K. Provide filler plates to cover unused spaces in panelboards.

3.2 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.

- B. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for all main circuit breakers. Tests listed as optional are not required.
- C. Test GFCI circuit breakers to verify proper operation.
- D. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.3 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
- B. Adjust alignment of panelboard fronts.

3.4 CLEANING

- A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 26 24 16

SECTION 26 27 26 - WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Receptacles.
- B. Power Pedestals.

1.2 REFERENCE STANDARDS

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2014h, with Amendments (2017).
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- C. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- D. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).
- E. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of outlet boxes with landscaping, structures, equipment, etc. installed under other sections or by others.
 - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
 - 3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
 - 4. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 PRODUCTS

2.1 WIRING DEVICES - GENERAL REQUIREMENTS

- A. Provide wiring devices suitable for intended use with ratings adequate for load served.

2.2 RECEPTACLES

A. Manufacturers:

- 1. Hubbell Incorporated; _____: www.hubbell.com/#sle.
- 2. Leviton Manufacturing Company, Inc; _____: www.leviton.com/#sle.
- 3. Pass & Seymour, a brand of Legrand North America, Inc; _____: www.legrand.us/#sle.

B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.

- 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
- 2. NEMA configurations specified are according to NEMA WD 6.

C. Convenience Receptacles:

- 1. Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as weather resistant type complying with UL 498 Supplement SD suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.

2.3 POWER PEDESTALS

A. Manufacturers:

- 1. C.W. Cole & Company, Inc: www.colelighting.com

B. Cover: Cast aluminum with self-closing, locking door.

C. Cord Slots: In use slots backed with rubber baffle system to prevent ingress of water.

D. Pedestal model: 1/8" aluminum.

E. Pedestal is to allow for two conduit stub-ups.

F. Housing: 16 guage electro-galvanized steel.

G. Custom Color: Black

H. General Use Pedestals are to be TL310 Series with installed GFCI weather resistant duplex, 20A, 125V, NEMA 5-20R receptacle.

I. Stage Pedestals are to be TL410 Series with installed (2) GFCI weather resistant duplex, 20A, 125V, NEMA 5-20R receptacles and (1) GFCI weather resistant single, 30A, 240V, NEMA 6-30R receptacle.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

- A. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of wiring devices provided under this section.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches (150 mm) long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- I. Install wall switches with OFF position down.

- J. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- K. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- L. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

3.4 FIELD QUALITY CONTROL

- A. Inspect each wiring device for damage and defects.
- B. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.
- C. Test each receptacle to verify operation and proper polarity.
- D. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.5 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION 26 27 26

SECTION 26 28 13 - FUSES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Fuses.

1.2 REFERENCE STANDARDS

- A. NEMA FU 1 - Low Voltage Cartridge Fuses; 2012.
- B. UL 248-1 - Low-Voltage Fuses - Part 1: General Requirements; Current Edition, Including All Revisions.
- C. UL 248-12 - Low-Voltage Fuses - Part 12: Class R Fuses; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Bussmann, a division of Eaton Corporation; _____: www.cooperindustries.com/#sle.
- B. Littelfuse, Inc; _____: www.littelfuse.com/#sle.
- C. Mersen; _____: ep-us.mersen.com/#sle.

2.2 APPLICATIONS

- A. General Purpose Branch Circuits: Class RK1, time-delay.
- B. Individual Motor Branch Circuits: Class RK1, time-delay.

2.3 FUSES

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.
- C. Provide fuses of the same type, rating, and manufacturer within the same switch.
- D. Comply with UL 248-1.
- E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.
- F. Voltage Rating: Suitable for circuit voltage.
- G. Class R Fuses: Comply with UL 248-12.

1. Class RK1, Time-Delay Fuses

PART 3 EXECUTION

3.1 INSTALLATION

- A. Do not install fuses until circuits are ready to be energized.
- B. Install fuses with label oriented such that manufacturer, type, and size are easily read.

END OF SECTION 26 28 13

SECTION 26 28 16.16 - ENCLOSED SWITCHES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Enclosed safety switches.

1.2 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
- C. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013.
- D. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems; 2021.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- H. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
 - 4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having

jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperature between -22 degrees F (-30 degrees C) and 104 degrees F (40 degrees C) during and after installation of enclosed switches.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. ABB/GE: www.geindustrial.com
- B. Eaton Corporation: www.eaton.com
- C. Schneider Electric; Square D Products: www.schneider-electric.us
- D. Siemens Industry, Inc: www.usa.siemens.com
- E. Source Limitations: Furnish enclosed switches and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.2 ENCLOSED SAFETY SWITCHES

- A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
 - 1. Altitude: Less than 6,600 feet (2,000 m).
 - 2. Ambient Temperature: Between -22 degrees F (-30 degrees C) and 104 degrees F (40 degrees C).
- D. Horsepower Rating: Suitable for connected load.
- E. Voltage Rating: Suitable for circuit voltage.
- F. Short Circuit Current Rating:

1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location as determined by short circuit study performed in accordance with Section 26 05 73.
 2. Minimum Ratings:
 - a. Heavy Duty Single Throw Switches Protected by Class R Fuses: 200,000 rms symmetrical amperes.
- G. Provide with switch blade contact position that is visible when the cover is open.
- H. Fuse Clips for Fusible Switches: As required to accept fuses indicated.
1. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.
- I. Conductor Terminations: Suitable for use with the conductors to be installed.
- J. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
- K. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- L. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Outdoor Locations: Type 4X, stainless steel.
 2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.
- M. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
- N. Heavy Duty Switches:
1. Comply with NEMA KS 1.
 2. Conductor Terminations:
 - a. Provide compression lugs.
 - b. Lug Material: Copper, suitable for terminating copper conductors only.
 3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.
 4. Provide the following features and accessories where indicated or where required to complete installation:
 - a. Hubs: As required for environment type; sized to accept conduits to be installed.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.

- B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive enclosed safety switches.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide required support and attachment in accordance with Section 26 05 29.
- E. Install enclosed switches plumb.
- F. Mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches (2000 mm) above the floor or working platform.
- G. Provide grounding and bonding in accordance with Section 26 05 26.
- H. Provide fuses complying with Section 26 28 13 for fusible switches as indicated or as required by equipment manufacturer's recommendations.
- I. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
- J. Identify enclosed switches in accordance with Section 26 05 53.

3.3 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
- C. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.4 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.5 CLEANING

- A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.

- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 26 28 16.16

SECTION 26 56 00 - EXTERIOR LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Exterior luminaires.
- B. Drivers.
- C. Driver Encl

1.2 REFERENCE STANDARDS

- A. IEEE C2 - National Electrical Safety Code(R) (NESEC(R)); 2023.
- B. IES LM-63 - Approved Method: IES Standard File Format for the Electronic Transfer of Photometric Data and Related Information; 2019.
- C. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2019.
- D. IES LM-80 - Approved Method: Measuring Maintenance of Light Output Characteristics of Solid-State Light Sources; 2021.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- F. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2000 (Reaffirmed 2006).
- G. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; 2023.
- H. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- J. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.4 SUBMITTALS

- A. Before Installation (Submit as a single package):
 - 1. Shop Drawings:

- a. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
 2. **Product Data:** Provide manufacturer's data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
 - a. **LED Luminaires:**
 - 1) Include estimated useful life, calculated based on IES LM-80 test data.
 - 2) Include IES LM-79 test report upon request.
 - b. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
 3. **Certificates for Poles and Accessories:** Manufacturer's documentation that products are suitable for the luminaires to be installed and comply with designated structural design criteria.
- B. After Installation:**
1. **Operation and Maintenance Data:** Instructions for each product including information on replacement parts.
 2. **Project Record Documents:** Record actual connections and locations of pole foundations, luminaires, and any pull or junction boxes.

1.5 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. **Manufacturer Qualifications:** Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. **Product Listing Organization Qualifications:** An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.7 WARRANTY

- A. Provide five year manufacturer warranty for all LED luminaires, including drivers.
- B. Provide seven year manufacturer warranty for all poles.

PART 2 PRODUCTS

2.1 LUMINAIRE TYPES

- A. Furnish products as indicated in luminaire schedule included on the drawings.

2.2 LUMINAIRES

- A. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.
- E. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- F. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.
- G. LED Luminaires:
 - 1. Components: UL 8750 recognized or listed as applicable.
 - 2. Tested in accordance with IES LM-79 and IES LM-80.
 - 3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
- H. Exposed Hardware: Stainless steel.

2.3 DRIVERS

- A. Manufacturers:
 - 1. General Electric Company/GE Lighting: www.gelighting.com
 - 2. OSRAM Sylvania, Inc: www.osram.us
 - 3. Philips Lighting North America Corporation; www.usa.lighting.philips.com
 - 4. Where a specific manufacturer or model is indicated elsewhere in the luminaire schedule or on the drawings, substitutions are not permitted unless explicitly indicated.
- B. Drivers - General Requirements:
 - 1. Provide drivers containing no polychlorinated biphenyls (PCBs).
 - 2. Minimum Efficiency/Efficacy: Provide drivers complying with all current applicable federal and state driver efficiency/efficacy standards.
 - 3. Electronic Drivers: Inrush currents not exceeding peak currents specified in NEMA 410.

C. Dimmable LED Drivers:

1. Dimming Range: Continuous dimming from 100 percent to ten percent relative light output unless dimming capability to lower level is indicated, without flicker.
2. Control Compatibility: Fully compatible with the dimming controls to be installed.

2.4 DRIVER ENCLOSURES

A. Manufacturers:

1. Q-Tran, Inc: www.q-tran.com
2. Acuity Brands, Inc[<>]: www.acuitybrands.com
3. Cooper Lighting, a division of Cooper Industries[<>]: www.cooperindustries.com
4. Hubbell Lighting, Inc[<>]: www.hubbellighting.com

B. General Requirements

1. IP68 wet location listed for direct burial.
2. Stainless steel cover.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of luminaires provided under this section.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install products in accordance with manufacturer's instructions.
- D. Install luminaires in accordance with NECA/IESNA 501.

- E. Provide required support and attachment in accordance with Section 26 05 29.
- F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- G. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
- H. Pole-Mounted Luminaires:
 - 1. Maintain the following minimum clearances:
 - a. Comply with IEEE C2.
 - b. Comply with utility company requirements.
 - 2. Foundation-Mounted Poles:
 - a. Provide cast-in-place concrete foundations for poles as indicated, in accordance with Division 03.
 - 1) Install anchor bolts plumb per template furnished by pole manufacturer.
 - 2) Position conduits to enter pole shaft.
 - b. Install foundations plumb.
 - c. Install poles plumb, using leveling nuts as required to adjust to plumb.
 - d. Tighten anchor bolt nuts to manufacturer's recommended torque.
 - e. Install non-shrink grout between pole anchor base and concrete foundation, leaving small channel for condensation drainage.
 - f. Install anchor base covers or anchor bolt covers as indicated.
 - 3. Grounding:
 - a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
 - b. Provide supplementary ground rod electrode as specified in Section 26 05 26 at each pole bonded to grounding system as indicated.
 - 4. Install separate service conductors, size as indicated on drawings, from each luminaire down to handhole for connection to branch circuit conductors.
- I. Install accessories furnished with each luminaire.
- J. Bond products and metal accessories to branch circuit equipment grounding conductor.

3.4 FIELD QUALITY CONTROL

- A. Inspect each product for damage and defects.
- B. Operate each luminaire after installation and connection to verify proper operation.
- C. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts or drivers as determined by Architect.
- D. Measure illumination levels at night with calibrated meters to verify compliance with performance requirements. Record test results in written report to be included with submittals.

3.5 ADJUSTING

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
- B. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Architect.

3.6 CLEANING

- A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.7 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.
- B. Just prior to Substantial Completion, replace all lamps that have failed.

3.8 PROTECTION

- A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 26 56 00

SECTION 311000 – SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Protecting existing trees and grass to remain.
 - 2. Removing existing trees, shrubs, groundcovers plants and grass.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Disconnecting, capping or sealing and removal of storm drainage utilities.
 - 7. Temporary erosion and sedimentation control measures.
- B. Related Sections include the following:
 - 1. Division 01 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities.
 - 2. Division 01 Section "Temporary Tree and Plant Protection" for protecting trees remaining on-site that are affected by site operations.
 - 3. Division 01 Section "Execution" for verifying utility locations and for recording field measurements.
 - 4. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.
 - 5. Division 23 Section "Turf and Grasses and Plants" for finish grading including preparing and placing planting soil mixes and testing of topsoil material.
 - 6. Division 21, Division 22, Division 23, Division 26, Division 27, and Division 28 Sections for removal of site utilities except storm sewers.

1.3 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

- A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- B. Record drawings, according to Division 01 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.
- C. Storm Water Pollution Prevention Plan: Submit prior to beginning construction and maintain on-site, and available for regular review by the Architect the following:
 - 1. Copy of the Notice of Intent (NOI) if applicable.
 - 2. Copy of the Site Grading Permit if applicable.
 - 3. Copy of the SWPPP along with related written documents.
 - 4. Maintenance Log Book in conformance with the requirements indicated.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by Architect.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earth Moving."
 - 1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction and the Storm Water Pollution Prevention Drawings (SWPP).
- B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE PROTECTION

- A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.
 - 1. Do not store construction materials, debris, or excavated material within fenced area.
 - 2. Do not permit vehicles, equipment, or foot traffic within fenced area.
 - 3. Maintain fenced area free of weeds and trash.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
- C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.
 2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
 4. Backfill with soil as soon as possible.
- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.
1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
 2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Architect.

3.4 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
1. Arrange with utility companies to shut off indicated utilities.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Architect not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Architect's written permission.
- C. Removal of underground utilities is included in Division 21, Division 22, Division 23, Division 26, Division 27, and Division 28 Sections covering site utilities, if applicable.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction where required.
1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
 4. Use only hand methods for grubbing within tree protection zone.
 5. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Limit height of topsoil stockpiles to 72 inches.
 - 2. Do not stockpile topsoil within tree protection zones.
 - 3. Dispose of excess topsoil as specified for waste material disposal.
 - 4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction. Do not excavate greater than 36" below existing finish grade under any circumstances. Soils below this elevation are hazardous and have been capped previously to protect from exposure.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.8 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 311000

SECTION 312000 – EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns and grasses and exterior plants.
2. Excavating and backfilling for structures.
3. Drainage course for slabs-on-grade.
4. Subbase course for concrete walks and pavements.
5. Subsurface drainage backfill for walls and trenches.
6. Excavating and backfilling for storm drainage and subdrainage utility trenches.
7. Excavating and backfilling pits for buried storm drainage and subdrainage utility structures.

- B. Related Sections include the following:

1. Division 01 Section "Construction Progress Documentation and Photographic Documentation" for recording preexcavation and earthwork progress.
2. Division 01 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities.
3. Division 03 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
4. Division 26, Sections for installing underground electrical utilities and buried mechanical and electrical structures.
5. Division 31 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
6. Division 32 Section "Turf and Grasses" for finish grading, including preparing and placing topsoil and planting soil for lawns.

1.3 UNIT PRICES

- A. Unit prices for earthwork, if applicable, are included in Division 01 Section "Unit Prices."

- B. Rules of Measurement: Volume of material actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.

1. 24 inches outside of concrete forms other than at footings.
2. 12 inches outside of concrete forms at footings.

3. 6 inches outside of minimum required dimensions of concrete cast against grade.
4. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
5. 6 inches beneath bottom of concrete slabs-on-grade.
6. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

1.4 DEFINITIONS

A. Backfill:

1. Soil material, granular material or controlled low-strength material (flowable fill) used to fill an excavation:

B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation (over-excavation): Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

2. Bulk (Mass) Excavation: Excavation more than 10 feet in width and more than 30 feet in length.

3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by an independent geotechnical testing agency, according to ASTM D 1586.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

- L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.5 SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of plastic warning tape.
 - 2. Geotextile.
 - 3. Controlled low-strength material, including design mixture.
- B. Samples: 12-by-12-inch Sample of subdrainage and separation geotextile.
- C. Material Test Reports: If required, from a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
 - 1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
 - 2. Laboratory compaction curve according to ASTM D 698 for each on-site and borrow soil material proposed for fill and backfill.
- D. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

1.6 QUALITY ASSURANCE

- A. Contractor shall perform earth moving scope as indicated below and shall notify Owner immediately if any subgrade conditions appear to prohibit continuation of work that meets Specifications herein. Owner and landscape architect shall review issues in the field; if it is deemed an independent testing agency is needed to review conditions and make recommendations, Owner will procure and pay for such testing and additional remediation as recommended by testing agency.
- B. Preexcavation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
 - 3. Contact utility-locator service for area where Project is located before excavating.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

- C. Project-Site Information: Site base plans were developed from the available site survey information included in the Drawings. The Contractor is responsible for verifying utility information.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups CL, GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. No concentration of large fragments is permitted unless approved by the Geotechnical Testing Agency and Architect.
 - 1. Subject to meeting project requirements, existing on-site excavated soils may be utilized as fill material.
 - 2. Plasticity Index: Less than 30.
 - 3. Maximum dry density of at least 100 pounds per cubic foot.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
 - 2. Shot rock, asphalt and coal fragments.
- D. Subbase Material: Dense Graded Aggregate consisting of a naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; KYDOH Section 805; with a ¾" maximum nominal size aggregate, with at least 90 percent passing a 1-1/2 inch sieve and not more than 13 percent passing a No. 200 sieve.
- E. Base Course: Dense Graded Aggregate consisting of a naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; KYDOH Section 805; with a ¾" maximum nominal size aggregate, with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Dense Graded Aggregate consisting of a naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; KYDOH Section 805; with a ¾" maximum nominal size aggregate, with at least 90 percent passing a 1-1/2 inch sieve and not more than 13 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; KYDOH Section 805; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.
- J. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.
- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
- L. Granular Backfill: KTC No. 57 crushed building stone.

2.2 CONTROLLED LOW-STRENGTH MATERIAL

- A. Controlled Low-Strength Material Performance Additive:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
 - a. Darafill or Darafill Dry, W.R. Grace & Co.
 - b. Rheomac VMA 362, BASF Corporation – Admixture Systems
- B. Prohibited Admixture: Calcium chloride thiocyanates or admixture containing more than 0.05 percent chloride ions.
- C. Controlled Low Strength Material CLSM (Flowable fill): Self-compacting, flowable concrete material. Provide blend of cement, flyash, and sand with minimum cementitious content as follows:
 - 1. Excavatable flowable fill: 100 lb cement and 250 lb fly ash per cubic yard.
 - 2. Structural flowable fill (250 psi): 175 lb cement and 200 lb fly ash per cubic yard. Add CLSM performance additive at manufacturer's recommended dosage rate, adjusting water content to provide desired flow and strength characteristics

2.3 GEOTEXTILES

- A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with KYDOH Section 843 for Type II Fabric.
- B. Separation / Reinforcement Geotextile:
 - 1. Type 1: Tensar Biaxial Geogrid BX1200 or approved equal product.

2.4 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - 1. Red: Electric.

2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. NOTE- no excavation is to take place to a depth greater than 36" below existing finish grade. At 36", a protective clay cap has been placed to seal off potentially contaminated soils. Do not excavate to this depth or penetrate this clay cap. All structures, grading and utility specifications have been carefully designated to avoid the need to excavate to this depth. The Contractor shall notify the Owner and the Landscape Architect of any work or field conditions that may potentially compromise the existing clay cap. Any penetration of the existing clay cap by the Contractor and subsequent remediation that may be required shall be at the Contractor's expense.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- C. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, pavements, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."
- D. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.
- E. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 2. Install dewatering as required in Drawings to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions. Do not excavate below 36" from existing finish grades.
1. If excavated materials intended for fill and backfill include unsatisfactory soil or other materials and rock, replace with DGA.
 2. Unless otherwise indicated, remove rock and other unsuitable material to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches outside of concrete forms other than at footings.
 - b. 12 inches outside of concrete forms at footings.
 - c. 24 inches below bottom of footings where footings are specified to be soil bearing.
 - d. 6 inches outside of minimum required dimensions of concrete cast against grade.
 - e. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
 - f. 6 inches beneath bottom of concrete slabs on grade.
 - g. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
1. Excavations for Footings, Foundations, Retaining Walls or Within 10 Feet of Building Elements: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work. Refer to Drawings for additional requirements.
 2. Recompact areas loosened by excavation operations prior to placing reinforcing steel.
 3. Remove loose soil, debris and excess surface water from the bearing surface prior to concrete placement.
 4. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.
- B. Overexcavate all soft and deleterious material below foundations only as directed and with approval by Architect and Owner and backfill to foundation bearing elevation with approved fill material.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: 12 inches each side of pipe or conduit unless otherwise indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
 - 3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 SUBGRADE INSPECTION

- A. Notify Owner and Architect when excavations have reached required subgrade. Notify Owner and Architect if any subgrade conditions appear to be unsatisfactory and not meet required compaction levels noted herein.
- B. If Owner and Architect in consultation determine that unsatisfactory subgrade conditions may be present, Owner will procure and pay for additional testing by an independent agency. Once additional direction is given, Contractor shall continue excavation and replace with compacted fill material as directed
- C. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2000 psi, may be used when approved by Architect.
 - 1. Fill unauthorized excavations under other construction or utility pipe or conduit as directed by Architect.

2. Any remediation required due to the Contractor's unauthorized excavation greater than 36" below existing finish grade shall be at the Contractor's expense.

3.10 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL, GENERAL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 2. Surveying locations of underground utilities for Record Documents.
 3. Testing and inspecting underground utilities.
 4. Removing concrete formwork.
 5. Removing trash and debris.
 6. Removing temporary shoring and bracing, and sheeting.
 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Backfill trenches excavated under footings and within 18 inches of bottom of footings with DGA; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 03 Section "Cast-in-Place Concrete."
- D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.
 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Backfill voids with approved granular fill while installing and removing shoring and bracing.
- F. Place and compact final backfill of satisfactory soil to final subgrade elevation in planting areas. In hardscape areas, place and compact final backfill with approved granular fill to subgrade elevation.

- G. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 FILL

- A. Place and compact fill material in layers to required elevations as follows:

- 1. Under grass and planted areas, use satisfactory soil material.
- 2. Under walks and pavements, use satisfactory soil material.
- 3. Under steps and ramps, use satisfactory soil material.
- 4. Under footings and foundations, satisfactory soil material.

- B. Place and compact engineered fill materials in layers to required elevation.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

- 1. Provide a smooth transition between adjacent existing grades and new grades.
- 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

- 1. Lawn or Unpaved Areas: Plus or minus 1 inch.
- 2. Pavements: Plus or minus 1/2 inch.

3.16 SUBBASE UNDER CONCRETE SLABS-ON-GRADE

- A. Place subbase on subgrades free of mud, frost, snow, or ice.

- B. On prepared subgrade, place and compact subbase under cast-in-place concrete slabs-on-grade as follows:

- 1. Place subbase 6 inches or less in compacted thickness in a single layer.
- 2. Place subbase that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
- 3. Compact each layer of subbase to required cross sections and thicknesses to not less than 98 percent of maximum dry unit weight according to ASTM D 698.

3.17 DRAINAGE COURSE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
 - 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 - 2. Place drainage course 6 inches or less in compacted thickness in a single layer.
 - 3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 - 4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional approved granular material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property. Provide written documentation of disposal location(s) for all material hauled off site.

END OF SECTION 312000

SECTION 321216 – ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Hot-mix asphalt patching.
 - 2. Hot-mix asphalt paving.
 - 3. Hot-mix asphalt paving overlay.
 - 4. Pavement-marking paint.
- B. Related Sections:
 - 1. Division 2 Section "Site Clearing" for demolition, removal, and recycling of existing asphalt pavements.
 - 2. Division 2 Section "Earthwork" for aggregate subbase and base courses.

1.3 DEFINITION

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
 - 1. Job-Mix Designs: For each job mix proposed for the Work.
- B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
- C. Samples: For each paving fabric, 12 by 12 inches minimum.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Each paving fabric, 12 by 12 inches minimum.
 - 2. Each type and color of preformed traffic-calming device.
 - 3. Each pattern and color of precut marking material.
- E. Qualification Data: For qualified manufacturer and Installer.
- F. Material Certificates: For each paving material, from manufacturer.

- G. Material Test Reports: For each paving material.

1.5 SYSTEM DESCRIPTION

- A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of standard specifications of state or local DOT.
 - 1. Standard Specification: Kentucky Department of Highways (KYDOH), "Standard Specification for Road and Bridge Construction", current edition.
 - 2. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by the Kentucky Transportation Cabinet and LFUCG.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. Prime Coat: Minimum surface temperature of 60 deg F.
 - 2. Tack Coat: Minimum surface temperature of 60 deg F.
 - 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
 - 4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 - 5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

- 1.9 Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials and 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: KYDOH Section 805, sound; angular crushed stone, crushed gravel, or properly cured, crushed blast-furnace slag.
- C. Fine Aggregate: KYDOH Section 804, sharp-edged natural sand or sand prepared from stone, gravel, properly cured blast-furnace slag, or combinations thereof.
- D. Mineral Filler: KYDOH Section 804, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: KYDOH Section 806.
- B. Asphalt Cement: KYDOH Section 806.
- C. Prime Coat: KYDOH Section 806.
- D. Tack Coat: KYDOH Section 806, emulsified asphalt of suitable grade and consistency for application.
- E. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.
- B. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 45 minutes.
 - 1. Color: White and blue, as indicated.
- C. Thermoplastic Markings: Comply with KYDOH Section 717.

2.4 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Provide Highway Design Mix CLIII 0.38D PG64-22.
3. Provide the maximum allowable recycled asphalt content as permitted by the KYDOH Standard Specifications for the applicable mix.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph.
 2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- C. Proceed with paving only after unsatisfactory conditions have been corrected.
- D. Verify that utilities and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

3.2 PATCHING

- A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd..
 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.
- D. Where new asphalt pavement abuts existing asphalt pavement, provide continuous edge key.

3.3 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
 - 1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.
- C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 - 2. Place hot-mix asphalt surface course in single lift.
 - 3. Spread mix at minimum temperature of 250 deg F.
 - 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 - 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
 - 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.5 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat to joints.
 - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 - 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
 - 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
 - 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.

6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.6 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927 or AASHTO T 245, but not less than 94 percent nor greater than 100 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 1. Base Course: Plus or minus 1/2 inch.
 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 1. Base Course: 1/4 inch.
 2. Surface Course: 1/8 inch.
 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.8 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.9 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage and pay for a qualified independent geotechnical engineering testing agency to perform field quality-control testing. The Contractor will be responsible for understanding the requirements and frequency of testing and coordinating with the testing agency.
- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. In-Place Density: Take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.
 - 1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
 - 2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
 - a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.
 - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- E. Replace and compact hot-mix asphalt where core tests were taken.
- F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.10 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

SECTION 32 1313 – CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes exterior cement concrete pavement for the following:
 - 1. Curbs.
 - 2. Stairs
 - 3. Walkways with broomed finish
 - 4. Walkways with integral color
 - 5. Unit paver base.

- B. Related Sections include the following:
 - 1. Division 03 Section "Cast-in-Place Concrete" for general building applications of concrete.
 - 2. Division 31 Section "Excavation, Fill, Backfill, and Grading" for subgrade preparation, grading, and subbase course.
 - 3. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants of joints in concrete pavement and at isolation joints of concrete pavement with adjacent construction.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.3 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.

- B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

- C. Qualification Data: For manufacturer and testing agency.

- D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Admixtures.

- E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Admixtures.

4. Curing compounds.
5. Applied finish materials.
6. Bonding agent or epoxy adhesive.
7. Joint fillers.

F. Field quality-control test reports.

G. Minutes of preinstallation conference.

1.4 QUALITY ASSURANCE

A. **Manufacturer Qualifications:** Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. **ACI Publications:** Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

C. **Concrete Testing Service:** Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

D. **Mockups:** Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Obtain Architect's approval of mockups before starting construction.
4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
5. Demolish and remove approved mockups from the site when directed by Architect.
6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. **Preinstallation Conference:** Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1. Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement construction practices. Require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:

- a. Contractor's superintendent.
- b. Concrete pavement subcontractor.

1.5 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 - 1. Use flexible or curved forms for curves with a radius 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.
- C. Plain Steel Wire: ASTM A 82, galvanized.
- D. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.
- E. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- F. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.
- G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
 - 1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:

1. Portland Cement: ASTM C 150, Type I, gray. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F.
- B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar pavement applications and service conditions using similar aggregates and cementitious materials.
 1. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
 1. Available Products:
 - a. Axim Concrete Technologies; Cimfilm.
 - b. Burke by Edeco; BurkeFilm.
 - c. ChemMasters; Spray-Film.
 - d. Conspec Marketing & Manufacturing Co., Inc.; Aquafilm.
 - e. Dayton Superior Corporation; Sure Film.
 - f. Euclid Chemical Company (The); Eucobar.
 - g. Kaufman Products, Inc.; Vapor Aid.
 - h. Lambert Corporation; Lambco Skin.
 - i. L&M Construction Chemicals, Inc.; E-Con.
 - j. MBT Protection and Repair, ChemRex Inc.; Confilm.
 - k. Meadows, W. R., Inc.; Sealtight Evapre.

- l. Metalcrete Industries; Waterhold.
 - m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
 - n. Sika Corporation, Inc.; SikaFilm.
 - o. Symons Corporation; Finishing Aid.
 - p. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.
- E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
 - 1. Available Products:
 - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
 - b. Burke by Edoko; Aqua Resin Cure.
 - c. ChemMasters; Safe-Cure Clear.
 - d. Conspec Marketing & Manufacturing Co., Inc.; W.B. Resin Cure.
 - e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
 - f. Euclid Chemical Company (The); Kurez DR VOX.
 - g. Kaufman Products, Inc.; Thinfilm 420.
 - h. Lambert Corporation; Aqua Kure-Clear.
 - i. L&M Construction Chemicals, Inc.; L&M Cure R.
 - j. Meadows, W. R., Inc.; 1100 Clear.
 - k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
 - l. Symons Corporation; Resi-Chem Clear.
 - m. Tamms Industries Inc.; Horncure WB 30.
 - n. Unitex; Hydro Cure 309.
 - o. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

2.5 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
 - 1. If an asphaltic fiber joint filler is utilized, provide an acceptable polyethylene bond breaker tape where joint sealant is indicated.
- B. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:
 - 1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- C. Chemical Surface Retarder: Water-soluble, liquid-set retarder with color dye, for horizontal concrete surface application, capable of temporarily delaying final hardening of concrete to a depth of 1/8 to 1/4 inch.
 - 1. Available Products:
 - a. Burke by Edeco; True Etch Surface Retarder.
 - b. ChemMasters; Exposee.
 - c. Conspec Marketing & Manufacturing Co., Inc.; Delay S.
 - d. Euclid Chemical Company (The); Surface Retarder S.
 - e. Kaufman Products, Inc.; Expose.

- f. Metalcrete Industries; Surfard.
- g. Nox-Crete Products Group, Kinsman Corporation; Crete-Nox TA.
- h. Scofield, L. M. Company; Lithotex.
- i. Sika Corporation, Inc.; Rugasol-S.
- j. Vexcon Chemicals, Inc.; Certi-Vex Envioset.

D. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis, integral color to be used where called for on Drawings.

1. Available Manufacturers:

- a. Bayer Corporation.
- b. ChemMasters.
- c. Conspec Marketing & Manufacturing Co., Inc.
- d. Davis Colors.
- e. Elementis Pigments, Inc.
- f. Hoover Color Corporation.
- g. Lambert Corporation.
- h. Scofield, L. M. Company.
- i. Solomon Colors.

2. Color: As selected by Architect from manufacturer's full range.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

- 1. Compressive Strength (28 Days): 4500 psi.
- 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
- 3. Slump Limit: 4 inches, plus or minus 1 inch.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 6 percent plus or minus 1.5 percent for 1-1/2-inch nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use high-range, high-range, water-reducing and retarding admixture in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals.
1. Fly Ash or Pozzolan: 15 percent.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.
1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
 2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons.
 3. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction according to requirements in Division 31 Section "Excavation, Fill, Backfill, and Grading."
- C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
 - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
 - 1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
 - 2. Provide tie bars at sides of pavement strips where indicated.
 - 3. Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
 - 5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 50 feet, unless otherwise indicated.
 - 2. Extend joint fillers full width and depth of joint.

3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
 4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
 5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows to match jointing of existing adjacent concrete pavement:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
 3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
- D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site.
- F. Do not add water to fresh concrete after testing.
- G. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- I. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.
 1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.
- J. Screed pavement surfaces with a straightedge and strike off.
- K. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- L. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 2. Do not use frozen materials or materials containing ice or snow.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.
- M. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 1. Elevation: 1/4 inch.
 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
 3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
 4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
 5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.

6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: If deemed necessary, Owner will engage and pay for a qualified independent geotechnical engineering testing agency to perform field quality-control testing. The Contractor will be responsible for understanding the requirements and frequency of testing and coordinating with the testing agency.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 1. Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.
 - a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
- G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
- B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 1313

SECTION 321373 – CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Supplementary and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Expansion and contraction joints within cement concrete pavement.
- B. Related Sections include the following:
 - 1. Division 07 Section "Joint Sealants" for sealing nontraffic and traffic joints in locations not specified in this Section.
 - 2. Division 32 Section "Concrete Paving" for constructing joints in concrete pavement.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- C. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- D. Qualification Data: For Installer.
- E. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for sealants.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing of current sealant products within a 36-month period preceding the Notice to Proceed with the Work.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 for testing indicated, as documented according to ASTM E 548.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 - 2. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 3. When joint substrates are wet or covered with frost.
 - 4. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 5. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 COLD-APPLIED JOINT SEALANTS

- A. Multicomponent Jet-Fuel-Resistant Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements for formulation and with ASTM C 920 for type, grade, class, and uses indicated:
 - 1. Urethane Formulation: Type M; Grade P; Class 12-1/2; Uses T, M, and, as applicable to joint substrates indicated, O.
 - a. Available Products:
 - 1) Pecora Corporation; Urexpam, Dynatred.
 - 2) Sonneborn, Div. of ChemRex, Inc.; Sonolastic SL 2.
- B. Single-Component Jet-Fuel-Resistant Urethane Sealant for Concrete: Single-component, pourable, coal-tar-modified, urethane formulation complying with ASTM C 920 for Type S; Grade P; Class 25; Uses T, M, and, as applicable to joint substrates indicated, O.
 - 1. Available Products:
 - a. Sonneborn, Div. of ChemRex, Inc.; Sonolastic SL 1.
 - b. Tremco Sealant/Waterproofing Division; Vulkem 45SSL.

2.4 JOINT-SEALANT BACKER MATERIALS

- A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.
- B. Round Backer Rods for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
- C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.
- D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.

2.5 PRIMERS

- A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of backer materials.
 - 2. Do not stretch, twist, puncture, or tear backer materials.
 - 3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses provided for each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealants from surfaces adjacent to joint.

2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations with repaired areas are indistinguishable from the original work.

3.6 WARRANTY

A. Joint sealants shall come with a minimum five (5) year warranty for correction of deteriorated and / or failed sealants.

END OF SECTION 321373

SECTION 32 1400 – UNIT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Concrete pavers set in bituminous setting beds on concrete base.

B. Related Sections include the following:

1. Division 31 Section "Excavation, Fill, Backfill, and Grading" for excavation and compacted subgrade.
2. Division 31 Section "Concrete Pavement" for concrete base under unit pavers and for cast-in-place concrete curbs and gutters serving as edge restraint for unit pavers.
3. Division 7 Section "Joint Sealants" for sealing control and expansion joints in unit pavers with elastomeric sealants.

1.2 SUBMITTALS

A. Product Data: For the following:

1. Concrete Pavers.

B. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C 136.

C. Samples for Initial Selection: For the following:

1. Each type of unit paver indicated.

D. Samples for Verification:

1. Full-size units of each type of unit paver indicated.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of unit paver, joint material, and setting material from one source with resources to provide materials and products of consistent quality in appearance and physical properties.

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.
- B. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

1.5 PROJECT CONDITIONS

- A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

PART 2 - PRODUCTS

2.1 PAVERS

- A. Concrete Pavers Basis of Design Product: Solid interlocking, Concrete paving units complying with ASTM C1364 and resistant to freezing and thawing when tested according to ASTM C 67, made from normal-weight aggregates. Basis of Design Product is Reading Rock Archiline Elite Pavers. Subject to compliance with requirements, provide one of the following:
 - 1. Basis of Design- Reading Rock 'Archiline Elite'
 - 2. Unilock 'Promenade'
 - 3. Nitterhouse 'Urban Stone'
- B. Product requirements.
 - 1. Must be produced at a National Concrete Association Certified plant.
 - 2. Face Size and Shape: Width shall be between 4" – 5 5/8" wide x 16"-18" long (size variation noted due to differences in manufacturer products); generally a plank shape.
 - 3. Minimum 6000 PSI
 - 4. Color: Three color types, shades of gray, to create the color dissolve effect indicated on the Drawings
 - 5. Surface Air Voids: Maximum 1/32 inch, Density: Less than 3 occurrences per any 1 square inch, not obvious under direct daylight at 10 feet.

2.2 AGGREGATE SETTING-BED MATERIALS

- A. Graded Aggregate for Base: Sound, crushed stone or gravel complying with requirements in Division 31 Section "Excavation, Fill, Backfill, and Grading" for base course.
- B. Stone Screenings for Leveling Course: Sound stone screenings complying with ASTM D 448 for Size No. 10.

- C. Sand for Vertical Joints: Fine, sharp, washed, polymeric sand 100 percent passing No. 16 sieve and no more than 10 percent passing No. 200 sieve.
 - 1. Provide sand of color needed to produce required joint color.
- D. Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
 - 3. Permittivity: 0.5 per second, minimum; ASTM D 4491.
 - 4. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- E. Herbicide: Commercial chemical for weed control, registered with the EPA. Provide in granular, liquid, or wettable powder form.

PART 3 - EXECUTION

- A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.
- B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.
- C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
- D. Handle protective-coated brick pavers to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.
- E. Joint Pattern: As shown on contract drawings.
- F. Tolerances: Do not exceed 1/32-inch unit-to-unit offset from flush (lippage) or 1/8 inch in 10 feet from level, or indicated slope, for finished surface of paving.
- G. Expansion and Control Joints: Provide cork joint filler at locations and of widths indicated. Install joint filler before setting pavers. Make top of joint filler flush with top of pavers.
- H. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.
 - 1. Install edge restraints to comply with manufacturer's written instructions. Install stakes at intervals required to hold edge restraints in place during and after unit paver installation.
 - 2. For metal edge restraints with top edge exposed, drive stakes at least 1 inch (25 mm) below top edge.

3.2 BITUMINOUS SETTING-BED APPLICATIONS

- A. Apply primer to concrete slab or binder course immediately before placing setting bed.

- B. Prepare for setting-bed placement by locating 3/4-inch- deep control bars approximately 11 feet (3.3 m) apart and parallel to one another, to serve as guides for striking board. Adjust bars to subgrades required for accurate setting of paving units to finished grades indicated.
- C. Place bituminous setting bed where indicated, in panels, by spreading bituminous material between control bars. Spread mix at a minimum temperature of 250 deg F (121 deg C). Strike setting bed smooth, firm, even, and not less than 3/4 inch (19 mm) thick. Add fresh bituminous material to low, porous spots after each pass of striking board. After each panel is completed, advance first control bar to next position in readiness for striking adjacent panels. Carefully fill depressions that remain after removing depth-control bars.
 - 1. Roll setting bed with power roller to a nominal depth of 3/4 inch (19 mm). Adjust thickness as necessary to allow accurate setting of unit pavers to finished grades indicated. Complete rolling before mix temperature cools to 185 deg F (85 deg C).
- D. Apply neoprene-modified asphalt adhesive to cold setting bed by squeegeeing or troweling to a uniform thickness of 1/16 inch (1.6 mm). Proceed with setting of paving units only after adhesive is tacky and surface is dry to touch.
- E. Place pavers carefully by hand in straight courses, maintaining accurate alignment and uniform top surface. Protect newly laid pavers with plywood panels on which workers can stand. Advance protective panels as work progresses, but maintain protection in areas subject to continued movement of materials and equipment to avoid creating depressions or disrupting alignment of pavers. If additional leveling of paving is required, and before treating joints, roll paving with power roller after sufficient heat has built up in the surface from several days of hot weather.
- F. Joint Treatment: Place unit pavers with hand-tight joints. Fill joints by sweeping sand over paved surface until joints are filled. Remove excess sand after joints are filled.

3.3 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.
- B. Pointing: During tooling of joints, enlarge voids or holes and completely fill with grout. Point joints at sealant joints to provide a neat, uniform appearance, properly prepared for sealant application.
- C. Cleaning: Remove excess grout from exposed paver surfaces; wash and scrub clean.
 - 1. Remove temporary protective coating as recommended by coating manufacturer and as acceptable to paver and grout manufacturers.
 - 2. Do not allow protective coating to enter floor drains. Trap, collect, and remove coating material.

END OF SECTION 32 1400

SECTION 323114 – STEEL MESH FENCE SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Steel Mesh Fences and Gates: Medium Security.
- B. Related Sections include the following:
 - 1. Division 03 Section "Cast-in-Place Concrete" for concrete post concrete fill.
 - 2. Division 31 Section "Earth Moving" for site excavation, fill, and backfill where chain-link fences and gates are located.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for steel mesh fences and gates.
 - 1. Fence and gate posts, and fittings.
 - 2. Fence fabric, reinforcements, and attachments.
 - 3. Gates and hardware.
- B. Shop Drawings: Show locations of fences, posts, gates, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.
- C. Samples for Initial Selection: Manufacturer's color charts or 6-inch lengths of actual units showing the full range of colors available for components with factory-applied color finishes.
- D. Samples for Verification: For each type of steel mesh fence and gate indicated.
 - 1. Polymer-coated steel wire (for fabric) in 6-inch lengths.
 - 2. Polymer coating, in 6-inch lengths on shapes for posts and gate framing.
- E. Qualification Data: For Installer.
- F. Field quality-control test reports.
- G. Maintenance Data: For the following to include in maintenance manuals:

1. Polymer finishes.

1.4 QUALITY ASSURANCE

- A. **Installer Qualifications:** An experienced installer who has completed steel mesh fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. **Preinstallation Conference:** Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.5 PROJECT CONDITIONS

- A. **Field Measurements:** Verify layout information for steel mesh fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Basis-of-Design Product:** Subject to compliance with requirements, provide Metalco, "Twin Bar Architectural Fence" or a comparable product by one of the following:
 1. Omega Fence Co. "Doublewire"
 2. AMETCO Manufacturing Company, Inc. "Lattice"
 3. Designmaster "Contempo"
 4. Custom fabricated in accordance with the Drawings and this Specification section.

2.2 FENCE FRAMING

- A. **Posts:** Square cold-formed, electric-resistance-welded, steel pipe or tubing, with minimum yield strength of 45,000 psi and with outside dimension, minimum wall thickness, and weight complying with ASTM 513.00 and ASTM A787-01 with G90 zinc coating for the following fence height and strength and stiffness requirements:
 1. **Fence Height:** As indicated on Drawings. Post spacing shall be equal and as needed to match arcs in pavement material as indicated on drawings.
 2. **Duty Rating:** Medium.
 3. **Tube Size and Thickness:**
 - a. Line Post: 2 inch x 2 inch.
 - b. Gate Post: 3 inch x 3 inch.
 - c. Tube or Pipe Thickness: 11 Ga
 4. **Hardware:** Latches permitting operation from both sides of gate, hinges, hold backs. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.
 5. **Metallic-Coated Steel:** Posts, and frames protected with an external coating G90 zinc coating and a 4 mil polyester powder coating over the metallic coating.

2.3 FITTINGS

- A. General: Manufacturer's standard fittings, clips and accessories for mounting the fabric to the post.
- B. Post Caps: Provide for each post.
- C. Finish: Manufacturer's polyester powder coating to match finish and color of the fence fabric and posts.

2.4 CAST-IN-PLACE CONCRETE

- A. Materials: Portland cement complying with ASTM C 150, Type I aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94/C 94M.
 - 1. Concrete Mixes: Normal-weight concrete air entrained with not less than 3000-psi compressive strength (28 days), 3-inch slump, and 1-inch maximum size aggregate.

2.5 POLYMER FINISHES

- A. Supplemental Color Coating: In addition to specified metallic coatings for steel, provide fence components with polymer coating.
- B. Metallic-Coated Steel Framing and Fittings: Comply with ASTM F 626 and ASTM F 1043 for polymer coating applied to exterior surfaces and, except inside cap shapes, to exposed interior surfaces.
 - 1. Polymer Coating: Not less than 4-mil- thick polyester finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance.
 - 1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates and posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with manufacturer's written instructions and more stringent requirements specified.

3.4 STEEL MESH FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Recess post footing top below Poured in Place playground surfacing as indicated on drawings.
- C. Line Posts: Space line posts uniformly at 97-3/4 inches o.c.
 - 1. At changes in vertical alignment set posts to allow an equal step in each fence panel section. Minimum step is to be 3 inches.
- D. Steel Mesh Fabric: Apply fabric to inside of enclosing framework. Leave 1 inch between finish grade or surface unless otherwise indicated. Anchor to posts with manufacturer's standard fastening hardware.
- E. Fasteners: Install nuts for hardware on the side of the fence opposite the fabric side.

END OF SECTION 323113

328413 – PLANT IRRIGATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Underground low volume irrigation system.
 - 2. Pipe and fittings, valves, drip tubing, and accessories.
 - 3. Automatic control system with on-site weather station.
 - 4. Excavation and backfilling for installation of underground system components.

1.2 SYSTEM DESCRIPTION

- A. Layout design: Modify layout as needed to obtain required and complete coverage with manufacturer's standard heads as specified.
 - 1. Provide flow velocities that do not exceed 5.0 ft. Per second.
 - 2. Provide independent irrigation of individual bed zones or planters.
- B. Only similar types of heads with matched precipitation rates may run on same zone.
- C. Piping Design: Do not mix different irrigation types for each line. Provide main size as needed for proper flow, but not less than specified on plan.
- D. Provide electric solenoid controlled underground irrigation system manufactured especially for control of automatic circuit valves of underground irrigation system. Provide unit of capacity to suit number of circuits indicated.
 - a. Source Power: 120 volts
 - b. Low Voltage Controls: 24 volts AC.
- E. Provide controller to control all zones.
- F. The extent of the irrigation system is shown on the Drawings.

1.3 SUBMITTALS - REVIEW

- A. Comply with requirements of Section 01300.
- B. Product Data: System components.
- C. Shop Drawings:
 - 1. Indicate piping layout to water source.
 - 2. Include piping layout and details illustrating location and types of drip tubing, valves, control system and wiring.
 - 3. Indicate location of sleeves under pavements and conflicts with existing utilities.
- D. Samples
 - 1. Submit the following material samples:
 - a. Piping and fittings.
 - b. Wire connectors and sealer.
 - c. Control wire.

2. Submit the following equipment samples:
 - a. Drip tubing (5' length minimum).
 - b. Valves and access boxes.
 - c. Controller and weather station.
3. Approved equipment samples will be returned to the Contractor and may be used in the work before final approval.

1.4 SUBMITTALS - CLOSE-OUT

- A. Comply with the requirements of the General Conditions.
- B. Record Drawings:
 1. Indicate exact location of gate valves, wire locations; sprinkler head layout, drip tubing including spacing, automatic valves, quick couplers, all irrigation and drainage piping, etc.
 2. At the time of the irrigation mainline test, provide a preliminary set of "Record" drawings to the Owner's Authorized Representative.
- C. Operation and Maintenance Data: Comply with requirements of Section 01730.
 1. Provide instructions for operation and maintenance of system and controls, seasonal activation and shutdown, and manufacturer's parts catalog.
 2. Provide schedule indicating length of time each valve is required to be run to provide a determined amount of water.
 3. Include complete parts list with manufacturer's designations for each component.
- D. Loose Equipment to Furnish: Loose irrigation equipment, operating keys and spare parts will be furnished by the Irrigation Contractor in quantities as shown on the plans.
 1. Two (2) quick coupler keys and matching swivel hose ells.
 2. Two (2) valve keys for gate valves.
 3. Two (2) keys for each controller.

1.5 QUALITY ASSURANCE

- A. Installer's Qualifications: Single firm specializing in irrigation work with a minimum of five (5) years experience properly installing irrigation systems of comparable size.
 1. Provide references of your last five- (5) consecutive systems, and five systems of comparable size with bid proposal.
- B. Materials, equipment, and methods of installation shall comply with the following codes and standards:
 1. State of Kentucky Building Codes.
 2. American Society for Testing and Materials (ASTM).
 3. National Sanitation Foundation (NSF).
- C. Requirements of Regulatory Agencies:
 1. All work and materials shall be in full accordance with the latest rules and regulations of safety orders of Division of Industrial Safety; the Uniform Building Code and other applicable laws or regulations, including any local Plumbing Codes.
 2. Should the Contract documents be at variance with the aforementioned rules and regulations, notify the Owner's authorized representative for instructions before proceeding with work affected.
- D. Testing:
 1. Preliminary review of completed installation will be made prior to backfilling of trenches and hydrostatic testing.

2. Final review and testing shall be made in conjunction with the final review of lawn, shrub and tree planting.

E. Permits and Inspections:

1. Any permits for the installation or construction of any work included under this contract, which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the contractor, each at the proper time.
2. The Contractor shall also arrange for and pay all costs in connection with any inspection and examination required by these authorities.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver irrigation system components in manufacturer's original, undamaged and unopened containers, with labels intact and legible.
- B. Deliver plastic pipe in bundles, packaged to provide adequate protection of pipe ends.
- C. Store and handle materials to prevent damage and deterioration.
- D. Provide secure, locked storage for valves, sprinkler heads and similar components that cannot be immediately replaced to prevent installation delays.
- E. Contractor is responsible for materials through final acceptance.

1.7 PROJECT CONDITIONS

- A. Protect existing trees, plants, and lawns and other features designated to remain as part of the final landscape.
- B. The Contractor shall carefully coordinate with the landscape work and other site developments, including all new and existing utilities.
- C. The Contractor shall verify the correctness of all finish grades within the work area to ensure the proper soil coverage of the irrigation pipes.
- D. Irrigation system layout is diagrammatic. Exact location of piping, sprinkler heads, valves, and other components shall be established by Contractor in the field at time of installation.
- E. Space components as indicated. Do not exceed spacing shown on Drawings.
- F. Locate existing utilities in areas of work. If utilities are to remain, provide adequate means of protection during the system installation. Repair utilities damaged during the work to the satisfaction of the Utility Owner and at the Contractor's expense. Notify local Utility Protection Service three (3) days prior to beginning excavation work.
- G. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, notify the Owner's Authorized Representative immediately for direction as to procedure. Cooperate with the Owner and Utility companies in keeping active services and facilities in operation.
- H. Minor adjustments in system layout will be permitted to clear existing field obstruction. Final system layout shall be acceptable to the Owner's Authorized Representative.

1.8 WARRANTY

- A. Warranties are subject to the General and Supplementary Conditions.
- B. Irrigation Contractor is responsible to insure complete coverage as specified herein of the areas to be irrigated. During the warranty period the Irrigation Contractor shall make any adjustments as necessary to maintain proper coverage.
- C. If, within one year from the date of completion, settlement occurs, and adjustments in pipes, valves and sprinkler heads, lawn areas or paving are necessary to bring the system, grade or paving to the proper level of the permanent grades. The Contractor, as part of the work under his Contract, shall make all adjustments without extra cost to the Owner, including the restoration of all damaged planting, paving or other improvements of any kind.
- D. Should any operational difficulties in connection with the irrigation system develop within the specified guarantee period, which, in the opinion of the Owner's Authorized Representative may be due to inferior material and/or workmanship, said difficulties shall be immediately corrected by the Contractor to the satisfaction of the Owner at no additional cost to the Owner, including any and all other damages caused by such defects.

1.9 OPERATION & MAINTENANCE — IRRIGATION SYSTEM

- A. The entire irrigation system shall be under fully automatic operation for a period of three (3) days prior to any planting.
- B. It is the Landscape Contractor's responsibility to determine water application rates and controller cycling. The Irrigation Contractor will instruct the Landscape Contractor on the operation and programming of the controller and will assist the Landscape Contractor as necessary in such operations throughout the one-year maintenance period. Any adjustments, repairs, etc., other than programming are the total responsibility of the Irrigation Contractor.
- C. The Irrigation Contractor shall service the system at the request of the Owner's Authorized Representative during the guarantee period and shall be paid for work performed which is not covered by the guarantee. The Irrigation Contractor shall winterize the system the first year as part of this contract, and provide written instructions to the Owner's Authorized Representative for future service and maintenance.
- D. The Irrigation Contractor shall return to the site during the subsequent spring season and demonstrate to the Owner's Authorized Representative the proper procedures for the system start-up, operation and maintenance.

PART 2 - PRODUCTS

2.1 UNAUTHORIZED MATERIALS

- A. Materials and products required for work of this section shall not contain asbestos. Polychlorinated biphenyl (PCB) or other hazardous materials identified by the Owner.

2.2 IRRIGATION SYSTEM MANUFACTURERS

- A. All irrigation system components shall be supplied by regionally authorized distributors to provide single source responsibility for warranty service and operations to conform to specifications in all aspects. Unless specifically stated otherwise, the Irrigation Contractor may assume the phrase "Ac-

ceptable Substitute”, except that the burden is upon the Contractor to prove such equality. If the Contractor elects to prove such equality, he/she must request the Landscape Architect’s and the Owner’s Authorized Representative’s approval in writing (one week prior to bid) to substitute such item for the specified item, stating the cost difference involved with supporting data and samples to permit a fair evaluation of the proposed substitute with respect of quality, serviceability, warranty, and cost. If sprinkler heads or remote control valves are requested to be substituted, each zone affected by such substitution shall be recalculated for pressure loss, GPM, and shall be submitted to the Owner’s Authorized Representative for his review.

2.3 MATERIALS

- A. All materials to be incorporated in this system shall be new and without flaws or defects and of quality and performance as specified and meeting the requirements of this system.
- B. Plastic Pipe
 - 1. All piping shall be from virgin parent material. The pipe shall be homogeneous throughout and free from visible cracks, holes, foreign materials, blisters, deleterious wrinkles and dents. All pipe shall be National Sanitation Foundation (NSF) approved.
 - 2. For all irrigation piping, use polyvinyl chloride (PVC) 1120 with a minimum class rating of 200, sized to maintain a maximum flow velocity of less than 5 ft. per second (FPS).
 - 3. Pipe shall be marked at intervals (not to exceed 5’) with the following information: Manufacturer’s name or trademark, nominal pipe size, schedule, PVC type and grade (i.e. PVC 1120), SDR rating class, working pressure at 73 degrees F.
 - 4. Caution should be utilized in handling Type I pipe due to the possibility of cracking or splitting when dropped or handled carelessly.
 - 5. When connection is plastic to metal, male adapters shall be used. The male adapter shall be hand tightened, plus one turn with a strap wrench.
 - 6. Comply with pipe sizes indicated on drawings. No substitution of smaller pipe will be permitted. Larger sizes may be used subject to acceptance of the Owner’s Authorized Representative. Remove damaged and defective pipe from site.
 - 7. All PVC pipe to be furnished in 20’ lengths.
- C. Piping for Sleeving
 - 1. For sleeves under six inches (6”) in size, high impact type, polyvinyl chloride (PVC) 1120, minimum Schedule 40.
 - 2. For sleeves six inches (6”) and above in size shall be Polyvinyl Chloride (PVC) 1120 Class 200.
 - 3. Irrigation Contractor shall be responsible for the coordination of sleeves for all piping passing through concrete curbing, under paved areas, concrete or masonry walls and floors while the same are under construction
- D. Fittings
 - 1. Fittings for Solvent -weld PVC Pipe shall be Schedule 40 or 80, polyvinyl chloride (PVC), Type 1 injection molded fittings suitable for solvent weld or threaded connections, to meet ASTM D-2466-73 and D-2467-73 NSF approved. Fittings made of other materials are not permitted.
 - 2. Manufactured by the following:
 - a. Lasco, Anaheim, CA
 - b. Spears, Sylmar, CA
 - 3. Threaded PVC nipples shall be Schedule 80. Use high quality grade of Teflon tape for threaded fittings.
 - a. Saddle fittings are not permitted.
 - b. Use high quality grade of Teflon tape for sprinkler head and electric remote control valve connections.

- E. Isolation Valves
 - 1. Gate valves under 3" shall be 200 psi rated W.O.G. 200 domestically manufactured with bronze bodies. Valves shall be equipped with tee handles. As manufactured by Watts Regulator, West Anover, MA or Acceptable Substitute.

- F. Quick Coupling Valves
 - 1. Valve shall be three-quarter inch (3/4") female thread.
 - 2. Acceptable Products:
 - a. Rain Bird model 3RC
 - 3. Furnish one (1) valve key fitted with be three-quarter inch (3/4") swivel hose ells.
 - 4. Acceptable Products:
 - a. Rain Bird model 33DK
 - 5. All quick coupling valve keys and hose swivels shall be of the same manufacturer as the quick coupler.

- G. Valve Boxes
 - 1. Tapered rib reinforcement enclosure of rigid tensile strength plastic material components chemically inert and unaffected by moisture, ultra violet light, corrosion and temperature changes. Lid and base shall withstand normal loads exerted by turf equipment without collapsing. Lid to be green in color.
 - 2. Acceptable Manufacturers:
 - a. Armor Access
 - b. Carson Brooks
 - c. Hubbell Power Systems
 - 3. For remote control valves and quick coupler valves use rectangular standard turf box, 16" x 11".
 - 4. For Isolation valves use 9" circular turf box.

- H. Drip Tubing
 - 1. Tubing shall be continuously self-flushing, pressure-compensating dripperline consisting of nominal sized one-half inch low density, linear polyethylene tubing, housing internal pressure compensating, continuously self-flushing, integral drip emitters.
 - 2. The tubing shall be brown in color and conform to an outside diameter (O.D.) of 0.67 inches, and an inside diameter (I.D.) of 0.57 inches. The emitters shall have the ability to independently regulate discharge rates, with an output pressure of 7 to 70 PSI, at a constant flow.
 - 3. The emitter discharge rate shall be 0.61 gallons per hour utilizing a combination turbulent flow/reduced pressure compensation cell mechanism and a diaphragm to maintain uniform discharge rates. The emitters shall continuously clean themselves while in operation. The dripperline shall have 18" spacing between emitters as noted on drawing.
 - 4. Acceptable Products:
 - a. Rain Bird XFD series dripperline tubing.

- I. Automatic Controller
 - 1. The irrigation system controller shall be of a hybrid type that combines electro-mechanical and microprocessor-based circuitry capable of fully automatic and manual operation.
 - 2. The controller will be housed in a weatherproof, lockable cabinet suitable for wall.
 - 3. The controller shall operate on a 117 VAC \pm 10% power input and be capable of actuating up to two 24 VAC, 7VA solenoid valves per station plus a master valve or pump start relay. The controller shall be capable of operating four stations plus the master valve simultaneously. Controller output shall be protected against severe electrical surge.
 - 4. The controller shall have three separate irrigation programs (A, B, & C) which can have different start times, watering days, day cycles, and station timing. Each program shall have six start times per day.

5. The controller shall be expandable up to 13 stations.
6. The controller shall have a 365-day calendar with day-of-the month OFF feature. Programs will run on an ODD/EVEN day cycle, day-of-the-week ON/OFF cycle, or in cycles from 1 to 99 days. In addition, the controller shall have a programmable rain shutdown from 1 to 99 days.
7. The controller shall be capable of being operated manually at any time. A manual single station, a group of stations, or a program can be selected to run for the programmed time without affecting the normal program. This controller shall be capable of running a variable system test program without affecting the normal program.
8. The controller shall be capable of automatically adjusting irrigation run times based upon input from an on-site weather station combined with a built-in database of historical weather data and user-specified site conditions such as soil type, slope, sun exposure, etc.
9. Acceptable Products:
 - a. Rain Bird model ESP-SMT.

J. Control Wire

1. Hot wire: Single strand solid copper wire type, with PVC jacket. UF 600-volt AWG #14 minimum size, approved for direct burial. For runs over 2,000 L.F. use AWG #12. Contractor is to verify that wire sizes are within recommended wire run lengths for proper solenoid operation.
2. Common Wire: Single strand solid copper wire type, with PVC jacket. UF 600 volt AWG #12 minimum size, approved for direct burial.
3. Provide control or "hot" wires of any color other than white. Provide common wires white in color. Provide spare wire blue in color.

K. Splicing Material

1. Splicing material shall be 3M Direct Bury (DBY) splice kits as manufactured by 3M Corporation, Austin, TX or approved equal. Use DBR for larger wires.

L. Remote Control Valves

1. The remote control valve shall be normally closed 24 VAC 50/60-cycle solenoid actuated globe pattern. The pressure rating shall not be less than 150 psi.
2. The valve body and bonnet shall be constructed of UV-resistant plastic and have stainless steel screws; diaphragm shall be of nylon reinforced nitrile rubber.
3. The valve shall have both internal and external manual open/close control (internal and external bleed) to manually open and close the valve without electrically energizing the solenoid. The valve's internal bleed shall prevent flooding of the valve box.
4. The valve shall house a fully encapsulated, one-piece solenoid. The solenoid shall have a captured plunger with a removable retainer for easy servicing, and a leverage handle for easy turning. This 24 VAC 50/60 Hz solenoid shall open with 19.6-volt minimum at 150 psi. At 24 VAC average inrush current shall not exceed .23 amps.
5. The valve construction shall be such as to provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.
6. The complete valve control kit shall consist of the electric valve, a 200-mesh stainless steel filter screen, and a 30-psi pressure regulator.
7. See Drawings for size of valves.
8. Acceptable Products:
 - a. Rain Bird XCZ-100PRF series plastic electric remote control valve kit.

M. Accessory materials

1. Drainage fill at valve boxes:
 - a. Provide 1/2" to 3/4" washed pea gravel.
2. Trench backfill:
 - a. Conform to requirements of Planting soil mix as specified in Section 02900, Topsoil.

- b. Conform to requirements of backfill materials as specified in Section 02200.
- 3. Suitable excavated materials removed to accommodate the irrigation system work shall be used as fill materials provided it conforms to the requirements of fill as noted above.
- N. PVC Solvent Cement:
 - 1. Provide professional grade cement, Whitlam #PR32 or acceptable Substitute for PVC pipe and fittings.
- O. PVC Primer/Cleaner
 - 1. Provide professional grade primer/cleaner, Whitlam #PP32 or acceptable Substitute (purple) primer.

PART 3 - EXECUTION

3.1 GENERAL

- A. Provide sleeves wherever piping or electrical wires are placed under paved surfaces.
- B. Lay out work as accurately as possible to Drawings. Drawings are diagrammatic to the extent that swing joints, offsets, and fittings are not shown.
- C. The Irrigation Contractor shall carefully schedule his work with the Landscape Contractor and all other site developments.
- D. Sleeves are required wherever piping or electrical wires are placed under paved surfaces. (Installed as part of other sections and Contract). Irrigation Contractor is responsible for coordination of all sleeves.
- E. Full and completed coverage is required. Contractor shall make any necessary minor adjustments to layout as required to achieve full coverage of irrigated areas at no additional cost to the Owner.
- F. Where piping is shown on drawings to be under paved areas but running parallel and adjacent to planted areas, the intent is to install piping in planted areas. Do not install directly over another line in the same trench.
- G. It shall be the Contractor's responsibility to establish the location of all sprinkler heads in order to assure proper coverage of all areas. In no case shall spacing of sprinkler heads exceed distances shown on the drawings and/or those specified. Pipe sizes shall conform to those shown on drawings. No substitution of smaller pipe sizes will be permitted, but substitutions of larger sizes may be approved. All pipe damaged or rejected because of defects shall be removed from the site at the time of said rejection.
- H. Install irrigation system after completion of site grading, the irrigation system shall be installed and completely operational three days prior to the installation of any planting operations.

3.2 EXCAVATING AND BACKFILLING:

- A. All piping is to be trenched, other than one inch (1") which may be pulled.
- B. Excavate to depths required to provide two inches (2") depth of sand bedding material for piping when unsuitable bearing materials are encountered.

- C. Should utilities not shown on the plans be found during excavations, the Contractor shall promptly notify the Owner's Authorized Representative for instructions as to further action. Failure to do so will make Contractor liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities. Indicate such utility crossings on the record drawings promptly.
- D. Install main line irrigation lines with a minimum cover of sixteen inches (16") and a maximum cover of twenty-four inches (24") based on finished grades.
- E. Install lateral irrigation lines with a minimum cover of twelve inches (12") and a maximum cover of twenty-four inches (24") based on finished grades.
- F. Perform all excavations as required for installation of work included under this Section, including shoring of earth banks, if necessary. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations, to their original condition.
- G. Trenches shall be open, vertical sided construction wide enough to provide free working space around work installed and to provide adequate space for backfilling and compacting.
- H. When two (2) pipes are to be placed in the same trench, a six-inch (6") space is to be maintained between the pipes. The Contractor shall not install two pipes with one directly above the other.
- I. The Contractor shall cut trenches for pipe to required grade lines and compact trench bottom to provide accurate grade and uniform bearing for the full length of the line.
- J. The Contractor shall be held responsible for damages caused by these operations and shall immediately repair or replace damaged parts.

3.3 PIPE LINE ASSEMBLY

- A. General
 - 1. Install pipes and fittings in accordance with manufacturer's latest printed instructions.
 - 2. Clean all pipes and fittings of dirt, scales and moistures before assembly.
 - 3. All pipe, fittings and valves, etc., shall be carefully placed in the trenches. Interior of pipes shall be kept free from dirt and debris and when laying is not in progress, open ends of pipe shall be closed by approved means.
 - 4. All lateral connections to the main line as well as all other connections shall be made to the side of the main line pipe. No connections to the top of the line shall be allowed.
- B. Solvent-Welded Joints for PVC Pipe
 - 1. Use solvents and methods approved by solvent and pipe manufacturers.
 - 2. Cure joint a minimum of one hour before applying any external stress on the piping and at least twenty four (24) hours before placing the joint under water pressure, unless otherwise specified by the manufacturer.
 - 3. Cut all pipe with square ends and remove burrs, ridges and dirt. Check dry fit pipe and fitting. Clean pipe and fitting with purple primer and apply thin coat of cement to fitting with a liberal coat to pipe. Quickly push pipe fully into fitting using a 1/4 turning motion. Hold pipe and fitting together a minimum of 30 seconds, wipe off excess with cloth.
- C. Threaded Joints for PVC Pipe
 - 1. Use Teflon tape on all threaded PVC fittings.
 - 2. Use strap-style friction wrench only. Do not use metal-jawed wrench.
- D. Laying of Pipe

1. Pipes shall be bedded in at least in at least two inches (2") of finely divided material with no rocks or clods over one inch (1") diameter to provide a uniform bearing.
2. Pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction. One additional foot per 100 feet of pipe is the minimum allowance for snaking.
3. Do not lay PVC pipe when there is water in the trench.
4. Plastic pipe shall be cut with PVC pipe cutters or hacksaw, or in a manner so as to ensure that a square cut. Burrs at end cuts shall be removed prior to installation so that a smooth unobstructed flow will be obtained.
5. All plastic-to-plastic joints will be solvent-weld joints or slip seal joints. All plastic pipe and fittings shall be installed as outlined and instructed by the pipe manufacturer and it shall be the Contractor's responsibility to make arrangements with the pipe manufacturer for any field assistance that may be necessary. The Contractor shall assume full responsibility for the correct installation.

3.4 ISOLATION VALVES

- A. Shall be located in the following locations:
 1. After backflow preventer and prior to main supply loop.
 2. Between main line and each remote control valve.
 3. Between main line and each quick coupler valve.
 4. As located on irrigation system drawings within lawn areas.
- B. Install each isolation valve in an individual valve box with a six-inch (6") (deep) layer of washed gravel below the bottom of the valve.
- C. Seal threaded connections with Teflon tape.

3.5 IRRIGATION CONTROL VALVES

1. Install control valves in valve boxes grouped together where practical. Place no closer than twelve inches (12") to walk edges, buildings and walls.
2. All irrigation control valves shall be installed with ductile iron service tees (if mainline is 3" or larger).
3. Install line size bronze gate valve on pressure side of each control valve. Locate in valve box with control valve.
4. Install each electric control valve in an individual valve box with a six-inch (6") (deep) layer of washed gravel below the bottom of the valve.
5. Seal threaded connections with Teflon tape.
6. Valves shall be installed as shown in details and in accordance with manufacturer's instructions and specifications.

3.6 QUICK COUPLING VALVES

1. Shall be set a minimum of twelve inches (12") from walks, curbs, or paved areas where applicable or as otherwise noted. Quick coupling valves shall be housed in standard size valve boxes.
2. All quick coupler valves shall be installed on to ductile iron service tee.
3. Install one inch (1") bronze gate valve on pressure side of each quick coupler valve. Locate in valve box with quick coupler valve.
4. Valves shall be installed on a three- (3) elbow PVC Schedule 80 swing joint assembly.
5. Provide six-inch (6") (deep) layer of washed gravel below the bottom of the valve. Top of quick coupler valves shall be as close to the top of the valve box as possible. Top of gravel layer shall be three inches (3") below the top of the valve.
6. Quick coupling valves shall be set perpendicular to finished grade unless otherwise designated on the plans.

3.7 VALVE BOXES

- A. Valve boxes shall be set flush with grade in lawn areas and one half inch (1/2") above finish grade in ground cover and shrub bed areas.
- B. Install valve access boxes on a suitable base of gravel to provide a level foundation at proper grade and to provide drainage of the valve box.

3.8 DRIP TUBING

- A. Techline is designed for use in surface and sub-surface applications utilizing a grid design, the result being a complete wetted area within the grid. It can also be installed as single or "snaked" lines where grids are not justified. The most uniform way to install Techline is sub-surface at a uniform depth as specified.
- B. Techline is available in dripper flow rates of 0.61 gallons per hour with drippers spaced at 12" intervals. The drippers are designed to regulate flow at the specified output from 7 to 70 PSI with maximum recommended pressure of 45 PSI when using unclamped Techline insert fittings. The choice of dripper spacing and Techline lateral spacing is dependent on the soil type and plants being used. See drawing for details.
- C. Dripperline shall be staked down using 6" galvanized sod staples. Staples shall be spaced no further than 24" on center, but the contractor will place staples as closely as necessary to ensure that dripperline will not work its way to the surface.

3.9 AUTOMATIC CONTROLLER

- A. The automatic controller shall be installed at the approximate location shown on the drawings. Controller shall be pedestal mounted in locking stainless steel cabinet. (suitable power supply will be supplied as part of other Sections and Contract).
- B. Install per local code, manufacturer's latest printed instructions, and as detailed.
- C. Valve wires shall be neatly stripped to expose 1/4" of copper conductor for connections to the controller terminal strip. The common wire shall be connected directly to the controller's common terminal.
- D. Valve control wires shall be numbered at the terminal strip.
- E. Contractor to confirm final weather station location with Owner's Representative prior to installation.

3.10 CONTROLLERS POWER SUPPLY

- A. Power to the controller(s) shall be supplied from a dedicated circuit. (Installed as part of work of other sections and Contract).

3.11 CONTROL WIRING

- A. All electrical equipment and wiring shall comply with local and state codes and be installed by those skilled and licensed in the trade.
- B. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines whenever possible, and shall have a minimum of twelve inches (12") cover.

- C. Control wires shall be installed to the side of the main line whenever possible. Placement over pipes is not permitted.
- D. Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of twenty feet (20').
- E. An expansion curl shall be provided within three feet (3') of each wire connection and at least every one hundred feet (100') of wire length on runs of more than one hundred feet (100') in length. Expansion curls shall be formed by wrapping at least five (5) turns of wire around a one-inch (1") diameter pipe, then withdrawing pipe.
- F. Control wire splices at remote control valves to be crimped and sealed with specified splicing materials. Line splices will be allowed only on runs of more than five hundred (500') and they must be located in ten inch (10") round splice boxes which are green in color. The connector shall be 3M DBY splice kit by 3M Corporation, or accepted Substitute. Use one splice per connector sealing pack.
- G. The main line shall have two (2) spare wire installed its entire length and to the automatic controller. Label each end " spare wire". Spare wires to be blue in color.

3.12 CLOSING OF PIPE AND FLUSHING OF LINES

- A. All testing shall be done under the supervision of the Owner's Authorized Representative. Submit written requests for inspections to the Owner's Authorized Representative at least three (3) days prior to anticipated inspection date.
 - 1. Thoroughly flush out all water lines under a full head of water before installing heads, valves, quick coupler assemblies, etc. Maintain flushing for a minimum of three (3) minutes at the valve located furthest from water supply.
 - 2. After flushing, cap or plug all openings to prevent entrance of materials that would obstruct the pipe or clog heads. Leave in place until removal is necessary for completion of installation.
 - 3. Test as specified below.
 - 4. Upon completion of testing, complete assembly and adjust sprinkler heads for proper distribution.

3.13 TESTING

- A. Make hydrostatic when welded PVC joints have cured as per manufacturer's instructions.
 - 1. Pressurized mainlines:
 - a. Completely install water meter, mains, isolation valves and control valves. Do not open laterals.
 - b. Open all isolation valves.
 - c. Fill all lines with water and shut off at meter.
 - d. Pressurize the main with air to 70 PSI. monitor gauge for pressure loss for a minimum of four (4) hours.
 - e. Leave lines and fittings exposed throughout testing period.
 - f. Leaks resulting from tests shall be repaired and tests repeated until the system passes.
 - g. Test all isolation valves for leakage.
- B. Non-pressurized laterals:
 - a. Test piping after laterals and risers are installed and system is fully operational.

3.14 INSPECTIONS

- A. The contractor shall maintain proper facilities and provide safe access for inspection to all parts of the work.
- B. Irrigation inspection shall consist of a minimum of:

- a. Mainline pressure test.
 - b. Coverage test.
 - c. Final irrigation inspection.
- C. If the specifications, the Owner's Authorized representative's instructions, laws, ordinances or any public authority require any work to be tested or approved, the contractor shall give the Owner's Authorized Representative three (3) days notice of its readiness for inspection.
- D. The contractor shall be solely responsible for notifying the Owner's Authorized Representative where and when such work is in readiness or testing.
- E. If any work should be covered up without the approval of the Owner' Authorized Representative it must be uncovered, if required, for examination at the contractor's expense.

3.15 BACKFILLING AND COMPACTING

- A. After system is operating and required tests and inspections have been made, backfill trenches.
- B. Backfill for all trenches, regardless of the type of pipe to be covered, shall be compacted to minimum 95 percent density under pavements, 85 percent under planted areas.
- C. Backfill material shall be suitable material. Unsuitable material, including clods and rocks over two inches (2") in size shall be removed form the site.

3.16 CLEANING AND DISPOSAL OF WASTE MATERIAL

- A. Perform clean-up during installation of the work and upon completion of the work. Remove from site all excess materials, soil, debris, and equipment as fast as it accumulates.
- B. Restore and repair all disturbed or damaged areas resulting form irrigation installation operations to original condition in a manner acceptable to the Owner's Authorized Representative.
- C. Stockpile, haul from site, and legally dispose of waste materials, including unsuitable excavated materials, rock, trash, and debris.

END OF SECTION 32 8413

SECTION 32 92 00 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General, Supplementary and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sodding.
 - 2. Lawn renovation.
 - 3. Erosion-control material(s).
- B. Related Sections:
 - 1. Division 31 Section "Site Clearing" for topsoil stripping and stockpiling.
 - 2. Division 31 Section "Earth Moving" for excavation, filling and backfilling, and rough grading.

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of planting soil.
- B. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- C. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.
- D. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
 - 1. Certification of each seed mixture for turfgrass sod, identifying source, including name and telephone number of supplier.
- C. Qualification Data: For qualified landscape Installer.

- D. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- E. Material Test Reports: For existing surface soil.
- F. Samples for Verification: For each of the following:
 - 1. Erosion Control Blanket: 12 by 12 inches.
- G. Planting Schedule: Indicating anticipated planting dates for each type of planting.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn and meadow establishment.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
 - 2. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
 - 1. Report suitability of topsoil for lawn growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- D. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

1.7 PROJECT CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
 - 1. Summer Planting: July 1st – September 1st
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.8 MAINTENANCE SERVICE

- A. Initial Lawn Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
 - 1. Sodded Lawns: 60 days from date of Project Substantial Completion.

PART 2 - PRODUCTS

2.1 TURFGRASS SOD

- A. Turfgrass Sod: Certified, complying with TPI's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted. Do not use sod with netting.
- B. Turfgrass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
 - 1. Full Sun: Blend of three "fine blade turf type" Tall Fescue cultivars acceptable to the Architect.

2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 2 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
 - 1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes.

2.3 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 - 1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.

2.4 PLANTING ACCESSORIES

- A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.

2.5 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

- 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.6 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.7 EROSION-CONTROL MATERIALS

- A. Erosion Control Blankets: For slopes exceeding 6:1 and not indicated to be sodded. Short term, 100% biodegradable double net straw fiber erosion control blanket designed for use on moderate slopes for up to 1 year. Blanket shall be sewn together on 1.5" centers, FHWA FP-03, Type 2D erosion control blanket for slopes up to 2:1. 100% agricultural straw fiber matrix, straw applied at a rate of .5lbs/SY, top and bottom leno woven biodegradable nets with a mesh size of .5x1 inches, 100% biodegradable leno woven net, thread and matrix. Erosion Control Blanket S32BD or an equivalent product.

2.8 PLANTING SOIL MIX

- A. Planting Soil Mix: Topsoil mixed with the following soil amendments and fertilizers in the following quantities:

- 1. Weight of Lime per 1000 Sq. Ft.: As determined by Soil Test.
- 2. Weight of Sulfur per 1000 Sq. Ft.: As determined by Soil Test..
- 3. Weight of Commercial Fertilizer per 1000 Sq. Ft.: As determined by Soil Test.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
 - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
 - 2. Protect grade stakes set by others until directed to remove them.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 LAWN PREPARATION

- A. Limit lawn subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b. Mix lime with dry soil before mixing fertilizer.
 - 2. Spread planting soil mix to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
 - a. Spread approximately 1/2 the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil mix.
 - b. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
 - 1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
 - 2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
 - a. Apply fertilizer directly to surface soil before loosening.
 - 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
 - 4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
- D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove

ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

- E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

- A. Prepare area as specified in "Lawn Preparation" Article.
- B. For erosion-control blanket and turf reinforcement mat, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- C. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
 - 1. Lay sod across angle of slopes exceeding 1:3.
 - 2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.6 LAWN RENOVATION

- A. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
 - 1. Reestablish lawn where settlement or washouts occur or where minor regrading is required.
 - 2. Provide new topsoil as required.
 - 3. Lawn renovation shall be done by hydroseeding.
- B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.

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- C. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- D. Mow, dethatch, core aerate, and rake existing lawn.
- E. Remove weeds before hydroseeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
- G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.
- H. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 4 inches of existing soil. Provide new planting soil to fill low spots and meet finish grades.
- I. Apply seed and protect with straw mulch as required for new lawns.
- J. Water newly planted areas and keep moist until new lawn is established.

3.7 **LAWN MAINTENANCE**

- A. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.
 - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
- B. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches.
 - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
 - 2. Water lawn with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.
- C. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
 - 1. Mow grass to a height of 2 to 3 inches.
- D. Lawn Postfertilization: Apply fertilizer after initial mowing and when grass is dry.
 - 1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to lawn area.

3.8 SATISFACTORY LAWNS

A. Lawn installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Lawn: At end of maintenance period, a healthy, well-rooted, even-colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

3.9 LAWN WARRANTY

A. Warranty for all seeded and sodded lawns shall be for one (1) year past the date of project Final Completion.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris, created by lawn work, from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.

C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 32 9200

SECTION 32 9300 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Trees
2. Shrubs
3. Perennials
4. Groundcovers

B. Related Sections:

1. Division 31 Section "Site Clearing" for protection of existing trees and plantings, topsoil stripping and stockpiling, and site clearing.
2. Division 31 Section "Earth Moving" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
3. Division 32 Section "Turf and Grasses" for lawn.
4. Division 33 Section "Subdrainage" for below-grade drainage of landscaped areas, paved areas, and wall perimeters.

1.3 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than sizes indicated; wrapped, tied, rigidly supported, and drum laced as recommended by ANSI Z60.1.
- C. Clump: Where three or more young trees were planted in a group and have grown together as a single tree having three or more main stems or trunks.
- D. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of exterior plant required.
- E. Finish Grade: Elevation of finished surface of planting soil.
- F. Multi-Stem: Where three or more main stems arise from the ground from a single root crown or at a point right above the root crown.
- G. Planting Soil: Native or imported topsoil, mixed with soil amendments.

- H. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.
- I. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each of the following:
 - 1. Edging materials and accessories, of manufacturer's standard size, to verify color selected.
- C. Qualification Data: For qualified landscape Installer.
- D. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
 - 1. Manufacturer's certified analysis for standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- E. Material Test Reports: For existing surface soil and imported topsoil.
- F. Planting Schedule: Indicating anticipated planting dates for exterior plants.
- G. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
 - 1. Report suitability of topsoil for plant growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

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1. Selection of exterior plants purchased under allowances will be made by Architect, who will tag plants at their place of growth before they are prepared for transplanting.
- E. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above the ground for trees up to 4-inch caliper size, and 12 inches above the ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- F. Observation: Architect may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
 1. Notify Architect of sources of planting materials seven days in advance of delivery to site.
- G. Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver exterior plants freshly dug.
 1. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.
- B. Do not prune trees and shrubs before delivery except as approved by Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.
- C. Handle planting stock by root ball.
- D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.
 1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
 2. Do not remove container-grown stock from containers before time of planting.
 3. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.7 PROJECT CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 1. Spring Planting: March 1st to May 15th.
 2. Fall Planting: October 15th to December 1st.

- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed according to manufacturer's written instructions and warranty requirements.
- C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns unless otherwise acceptable to Architect.
 - 1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

1.8 WARRANTY

- A. Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, or incidents that are beyond Contractor's control.
 - b. Structural failures including plantings falling or blowing over.
 - c. Faulty operation of tree stabilization and edgings.
 - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Periods from Date of Substantial Completion:
 - a. Trees and Shrubs: One year.
 - b. Ground Cover and Plants: One year.
 - 3. Include the following remedial actions as a minimum:
 - a. Remove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season.
 - b. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - c. A limit of one replacement of each exterior plant will be required except for losses or replacements due to failure to comply with requirements.
 - d. Provide extended warranty for replaced plant materials; warranty period equal to original warranty period.

1.9 MAINTENANCE SERVICE

- A. Initial Maintenance Service for Trees, Shrubs, Ground Cover and Plants: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than 60 days past the date of Project Substantial Completion.

PART 2 - PRODUCTS

2.1 TREE AND SHRUB MATERIAL

- A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Provide trees and shrubs of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.
- C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- D. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.
- E. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.2 SHADE AND FLOWERING TREES

- A. Type 1 or Type 2 (Slower Growth) Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.
 - 1. Provide balled and burlapped trees.
 - 2. Branching Height: One-half of tree height.
- B. Small Upright Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:
 - 1. Stem Form: Single trunk or multi-trunk clump as indicated.
 - 2. Provide balled and burlapped trees.
- C. Small Spreading Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:
 - 1. Stem Form: Single trunk or multi-stem clump as indicated.
 - 2. Provide balled and burlapped trees.

2.3 DECIDUOUS SHRUBS

- A. Form and Size: Shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.
 - 1. Shrub sizes indicated are sizes after pruning.
 - 2. Provide balled and burlapped or container-grown shrubs as indicated.

3. Provide balled and burlapped trees.

2.4 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1 and the following requirements:

2.5 PLANTS

- A. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, complying with requirements in ANSI Z60.1.

2.6 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth. Stones shall not exceed 10% by volume.

1. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes.

2.7 INORGANIC SOIL AMENDMENTS

- A. Aluminum Sulfate: Commercial grade, unadulterated.

2.8 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

- B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.

- C. Manure: Well-rotted, composted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.9 FERTILIZER

- A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

PLANTS

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.10 MULCHES

- A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded pine bark.

2.11 TREE STABILIZATION MATERIALS

- A. Stakes and Guys:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or compression springs.

2.12 MISCELLANEOUS PRODUCTS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- B. Trunk-Wrap Tape: Two layers of crinkled paper cemented together with bituminous material, 4-inch-wide minimum, with stretch factor of 33 percent.

2.13 PLANTING SOIL MIX

- A. Planting Soil Mix: Mix topsoil with the following soil amendments and fertilizers in the following quantities:

1. Ratio of Loose Compost to Topsoil by Volume: 1:4.
2. Ratio of Loose Peat to Topsoil by Volume: 1:4.
3. Weight of Aluminum Sulfate per 1000 Sq. Ft.: As recommended by soil test.
4. Weight of Slow-Release Fertilizer per 1000 Sq. Ft.: As recommended by soil test.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before planting. Make minor adjustments as required.
- D. Lay out exterior plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.
- E. Trunk Wrapping: Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling.
- F. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
 - 1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.
- G. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING BED ESTABLISHMENT

- A. Loosen subgrade of planting beds to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 1. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b. Mix lime with dry soil before mixing fertilizer.
 - 2. Spread planting soil mix to a depth of 12 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
 - a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil mix.
- B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

- C. Before planting, restore planting beds if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

- A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
 - 1. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.
- B. Subsoil removed from excavations may not be used as backfill.
- C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
 - 1. Hardpan Layer: Drill 6-inch- diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.
- D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.
- E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE AND SHRUB PLANTING

- A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.
- B. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.
 - 1. Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- C. Set container-grown stock plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.
 - 1. Carefully remove root ball from container without damaging root ball or plant.
 - 2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- D. Organic Mulching: Apply 2-inch minimum thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

- E. Trunk Wrapping: Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping. Wrap trees of 2-inch caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling.

3.6 TREE AND SHRUB PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character.

3.7 TREE STABILIZATION

- A. Trunk Stabilization: Unless otherwise indicated, provide trunk stabilization as follows:
 - 1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend dimension shown above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
 - 2. Use 2 stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; 3 stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
 - 3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3.8 PLANTING BED MULCHING

- A. Mulch backfilled surfaces of planting beds and other areas indicated. Provide mulch ring around trees in lawn areas.
 - 1. Organic Mulch: Apply 2-inch minimum thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.

3.9 EDGING INSTALLATION

- A. Aluminum Edging: Install aluminum edging where indicated according to manufacturer's written instructions. Anchor with aluminum stakes spaced approximately 36 inches apart, driven below top elevation of edging.

3.10 PLANT MAINTENANCE

- A. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, adjusting and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings.

Spray or treat as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.

- B. **Ground Cover and Plant Maintenance:** Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.

3.11 CLEANUP AND PROTECTION

- A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

- B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

3.12 DISPOSAL

- A. **Disposal:** Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 334100 - STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Special Conditions, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe and fittings.
 - 2. Nonpressure transition couplings.
 - 3. Cleanouts.
 - 4. Stormwater inlets

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Stormwater inlets, junction boxes, pipe outlets and cleanouts. Include plans, elevations, sections, details, frames, covers, and grates.
- C. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.
- D. Field quality-control reports.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic drainage structures, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.
- D. Handle stormwater inlets according to manufacturer's written rigging instructions.

PART 2 - PRODUCTS

2.1 CONCRETE PIPE AND FITTINGS

- A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76.

1. Bell-and-spigot or tongue-and-groove ends and gasketed joints with ASTM C 443, rubber gaskets
2. Class III, Wall B.

2.2 NONPRESSURE TRANSITION COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
 1. For Concrete Pipes: ASTM C 443, rubber.
 2. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 3. For Fiberglass Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 4. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 5. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Shielded, Flexible Couplings:
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Cascade Waterworks Mfg.
 - b. Dallas Specialty & Mfg. Co.
 - c. Mission Rubber Company; a division of MCP Industries, Inc.
 2. Description: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

2.3 CLEANOUTS

- A. Cast-Iron Cleanouts:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Josam Company.
 - b. MIFAB, Inc.
 - c. Smith, Jay R. Mfg. Co.
 - d. Tyler Pipe.
 - e. Watts Water Technologies, Inc.
 - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
 2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, polished bronze cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
 3. Top-Loading Classification(s): Heavy Duty.
 4. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

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2.4 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R, and the following:
1. Cement: ASTM C 150, Type II.
 2. Fine Aggregate: ASTM C 33, sand.
 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

2.5 STORMWATER INLETS

- A. Catch Basin: Precast or cast-in-place basin and heavy duty grate and frame, size as indicated.
- B. Yard Inlet: As indicated on Drawings.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Division 2 Section "Earthwork."

3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow.

STORM UTILITY DRAINAGE PIPING

2. Install piping with minimum cover as indicated.
3. Install PE corrugated sewer piping according to ASTM D 2321.
4. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."

3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping according to the following:
 1. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
 2. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.4 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
 1. Use Heavy-Duty, top-loading classification cleanouts in all areas.
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 12 by 12 by 12 inches deep. Set with tops 1 inch above surrounding earth grade.
- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.5 DRAIN INSTALLATION (ALL)

- A. Install type of drains in locations indicated.
 1. Use Heavy-Duty, top-loading classification drains in all areas.
- B. Embed drains in 4-inch minimum concrete around bottom and sides.
- C. Fasten grates to drains if indicated.
- D. Set drain frames and covers with tops flush with pavement surface.
- E. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
- F. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 1 inch above finished surface elsewhere unless otherwise indicated.

3.6 CATCH BASIN INSTALLATION

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

STORM UTILITY DRAINAGE PIPING

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- C. Catch basins in paved areas shall have stainless steel frames and grates, heelproof and ADA compliant.

3.7 STORMWATER INLET INSTALLATION

- A. Construct inlets, head walls, aprons, and sides of reinforced concrete, as indicated.
- B. Set frames and grates to elevations indicated.

3.8 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

3.9 IDENTIFICATION

- A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
 - 1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.10 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Submit separate reports for each system inspection.
 - 2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
 - 1. Do not enclose, cover, or put into service before inspection and approval.
 - 2. Test completed piping systems according to requirements of authorities having jurisdiction.
 - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

STORM UTILITY DRAINAGE PIPING

4. Submit separate report for each test.
 5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
 - a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
 - b. Option: Test plastic piping according to ASTM F 1417.
 - c. Option: Test concrete piping according to ASTM C 924.
 - C. Leaks and loss in test pressure constitute defects that must be repaired.
 - D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.
- 3.11 CLEANING
- A. Clean interior of piping of dirt and superfluous materials. Flush with water.

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SECTION 334600 - SUBDRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes subdrainage systems for the following:
 - 1. Subdrains below pavement
 - 2. Retaining wall subdrains
- B. Related Sections include the following:

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. HDPE: High-density polyethylene plastic.
- C. PE: Polyethylene plastic.
- D. PP: Polypropylene plastic.
- E. PS: Polystyrene plastic.
- F. PVC: Polyvinyl chloride plastic.
- G. Subdrainage: Drainage system that collects and removes subsurface or seepage water.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Perforated-wall pipe and fittings.
 - 2. Solid-wall pipe and fittings.
 - 3. Drainage conduits.
 - 4. Geotextile filter fabrics.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPING MATERIALS

- A. Refer to the "Piping Applications" Article in Part 3 for applications of pipe, tube, fitting, and joining materials.

2.3 PERFORATED-WALL PIPES AND FITTINGS

- A. Perforated PE Pipe and Fittings:
1. NPS 6 and Smaller: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.
 2. NPS 8 and Larger: ASTM F 667; AASHTO M 252, Type CP; or AASHTO M 294, Type CP; corrugated; for coupled joints.
 3. Couplings: Manufacturer's standard, band type.

2.4 SOLID-WALL PIPES AND FITTINGS

- A. PE Pipe and Fittings: AASHTO M 294, Type S, corrugated, with smooth waterway, for coupled joints.
1. Couplings: AASHTO M 294, corrugated, band type, matching tubing and fittings.

2.5 SPECIAL PIPE COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant metal tension band and tightening mechanism on each end.
1. Sleeve Materials:
 - a. For Concrete Pipes: ASTM C 443, rubber.
 - b. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
 - c. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - d. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

SUBDRAINAGE

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2. Shielded Flexible Couplings: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant metal tension band and tightening mechanism on each end.

2.6 CLEANOUTS

- A. Cast-Iron Cleanouts: ASME A112.36.2M; with round-flanged, cast-iron housing; and secured, scoriated, Medium-Duty Loading class, cast-iron cover. Include cast-iron ferrule and countersunk, brass cleanout plug.

2.7 SOIL MATERIALS

- A. Backfill, drainage course, impervious fill, and satisfactory soil materials are specified in Division 31 Section "Earth Moving."

2.8 GEOTEXTILE FILTER FABRICS

- A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. when tested according to ASTM D 4491.
 1. Structure Type: Nonwoven, needle-punched continuous filament.
 2. Style(s): Flat and/or sock style as indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.
- B. If subdrainage is required for landscaping, locate and mark existing utilities, underground structures, and aboveground obstructions before beginning installation and avoid disruption and damage of services.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.3 PIPING APPLICATIONS

- A. Underground Subdrainage Piping:
 1. Perforated PE pipe and fittings, couplings, and coupled joints.

3.4 CLEANOUT APPLICATIONS

- A. In Underground Subdrainage Piping:
1. At Grade in Earth: Cast-iron cleanouts.
 2. At Grade in Paved Areas: Cast-iron cleanouts with brass cover and plug.

3.5 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
1. Subdrainage: Install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 36 inches, unless otherwise indicated.
 2. Lay perforated pipe with perforations down.
 3. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.
- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install PE piping according to ASTM D 2321.

3.6 PIPE JOINT CONSTRUCTION

- A. Join perforated, PE pipe and fittings with couplings for soil-tight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties"; or according to ASTM D 2321.
- B. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

3.7 CLEANOUT INSTALLATION

- A. Cleanouts for Subdrainage:
1. Install cleanouts from piping to grade. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.
 2. In vehicular-traffic areas, use NPS 4 cast-iron soil pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 18 by 18 by 12 inches in depth. Set top of cleanout flush with grade. Cast-iron pipe may also be used for cleanouts in nonvehicular-traffic areas.
 3. In nonvehicular-traffic areas, use NPS 4 cast-iron pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 12 by 12 by 4 inches in depth. Set top of cleanout plug 1 inch above grade.

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3.8 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect low elevations of subdrainage system to solid-wall-piping storm drainage system.

3.9 IDENTIFICATION

- A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tapes directly over piping.
 - 1. Install PE warning tape or detectable warning tape over ferrous piping.
 - 2. Install detectable warning tape over nonferrous piping and over edges of underground structures.

3.10 FIELD QUALITY CONTROL

- A. Testing: After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.11 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 33 4600

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CONCEPT RENDERING FOR REFERENCE ONLY

SCHEDULE OF DRAWINGS

CVR	COVER & SCHEDULE OF DRAWINGS
SRV	SITE SURVEY
SRV	SITE SURVEY WITH AERIAL PHOTO BACKGROUND
L000	SITE LOGISTICS PLAN
L100	EROSION PREVENTION SEDIMENT CONTROL PLAN (EPSC)
L200	SITE DEMOLITION / SITE CLEARING PLAN
L300	SITE GRADING PLAN
L301	SITE DRAINAGE PLAN
L302	STORM PROFILES
C100	SITE / CIVIL UTILITIES PLAN & PROFILE
C200	SITE SANITARY DETAILS
C300	SITE WATER DETAILS
L400	ENLARGED PLANS KEY
L401	SITE LAYOUT PLAN
L402	SITE MATERIALS PLAN
L403	ENLARGED PLANS - DOG LOT
L404	ENLARGED PLANS - STAGE
L405	ENLARGED PLANS - URBAN PLAYSCAPE
L406	FOG SYSTEM PLAN
L407	ENLARGED PLANS - SHADE STRUCTURE, UTILITY SCREEN & SWINGS
L500	SITE LANDSCAPE PLAN
L501	SITE LANDSCAPE DETAILS
L502	SITE IRRIGATION PLAN
L503	SITE IRRIGATION DETAILS
L600	SITE DETAILS
L601	SITE DETAILS
L602	SITE DETAILS
L603	SITE DETAILS
L604	SITE DETAILS
L605	SITE STRUCTURE INFORMATION FOR REFERENCE
L700	STAIR & RAMP SECTIONS
E000	SITE ELECTRICAL SYMBOLS
E001	ELECTRICAL DEMO SITE PLAN
E011	ELECTRICAL SITE PLAN
E701	ELECTRICAL DETAILS & SCHEDULES

ALLOWANCES

ALLOWANCE NO. 1: MODULAR RESTROOM BUILDING.
 Contractor shall include in their bid an Allowance of \$275,000 (two hundred seventy-five thousand dollars and zero cents) for the purchase and installation of one modular restroom building. The Owner will provide the successful bidder with a list of three modular restroom manufacturers that have been vetted and proven capable of providing the desired product within the project schedule. The manufacturer will provide a restroom building unit with one bathroom, one storage room and a mechanical chase included. The Allowance of \$250,000 also includes the building, freight and installation. The Allowance of \$250,000 also includes installation of the concrete pad by the Contractor. Utilities to serve this modular building are shown in the Documents and shall be included in the base bid, separate from the Allowance. At the time final quotes are received during construction for selection and purchase of modular restroom building, the Allowance will be adjusted as required by final quote and scope at that time.

CONSULTANT TEAM

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 KFI Engineers
 The Design Engineer

element design
 KPI ENGINEERS
 CVR

DATE: APRIL 2024
 DRAWN BY:
 CHECKED BY:
 REVISION:
 REVISION:
 REVISION:
 REVISION:
 REVISION:

Sheet Title: Cover

Drawing No: CVR



VICINITY MAP
SCALE: 1"=100'

- UTILITY OWNERS**
- ELECTRIC**
KENTUCKY UTILITIES
500 STONE ROAD
LEXINGTON, KY
BRENT BIRCHELL
(859) 278-9355
- WASTE WATER**
LFUGG
DIVISION OF WATER QUALITY
LISLE INDUSTRIAL ROAD
LEXINGTON, KY
(859) 425-2400
- WATER**
KENTUCKY AMERICAN
WATER COMPANY
2300 RICHMOND ROAD
LEXINGTON, KY
GREG TOMCO
(859) 268-6362
- TELEPHONE**
WINDSTREAM
130 WEST NEW CIRCLE ROAD
LEXINGTON, KY
DARRIN BUSKIRK
(859) 357-6224
- STATE ROADS**
TRANSPORTATION CABINET
DISTRICT OFFICE NO. 7
- CABLE TELEVISION**
TIME WARNER CABLE
2544 PALMING DRIVE
LEXINGTON, KY
(859) 514-1400
- NATURAL GAS**
COLUMBIA GAS COMPANY
2001 MERCER ROAD
LEXINGTON, KY
BRYAN SLONE
(859) 289-0253



UNDERGROUND UTILITIES

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY OF OBSERVED EVIDENCE ONLY. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

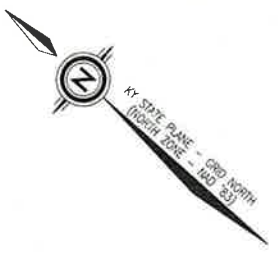
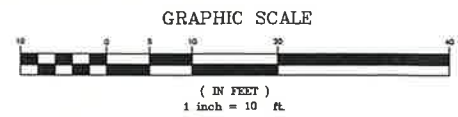
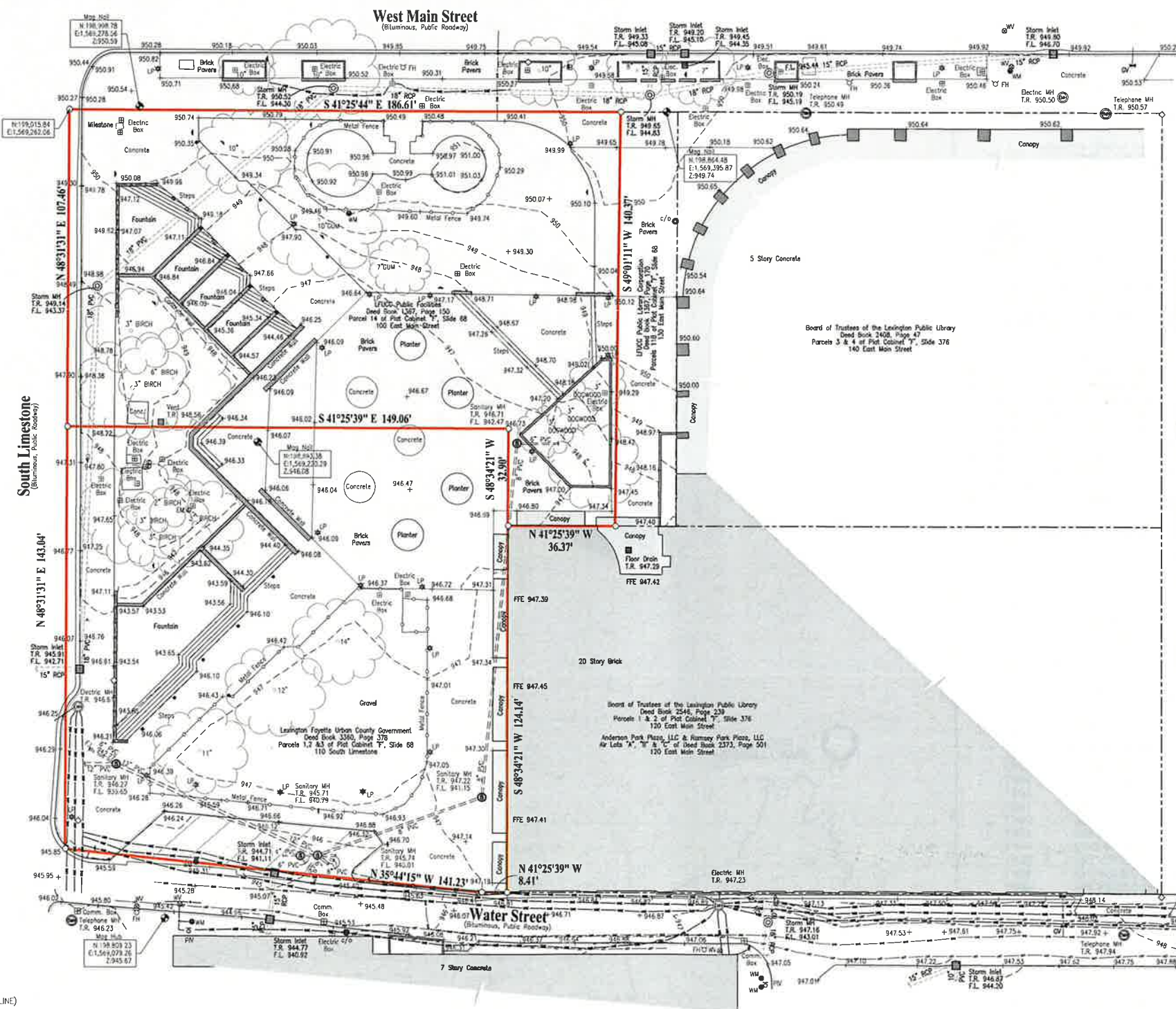
ZONING REQUIREMENTS
B-2B (LEXINGTON CENTER BUSINESS)

MINIMUM LOT SIZE	NO LIMITATION
MINIMUM LOT FRONTAGE	NO LIMITATION
MINIMUM FRONT YARD	NO LIMITATION
MINIMUM EACH SIDE YARD	NO LIMITATION
MINIMUM REAR YARD	NO LIMITATION
MINIMUM USEABLE OPEN SPACE	NO LIMITATION, EXCEPT THAT 10% SHALL BE REQUIRED FOR ANY RESIDENTIAL AREA
MAXIMUM LOT COVERAGE	NO LIMITATION
MAXIMUM HEIGHT OF BUILDING	NO LIMITATION

SETBACK NOTE

THE BUILDING SETBACK LINES SHOWN HEREON ARE BASED ON THE SURVEYOR'S INTERPRETATION OF THE SETBACK REQUIREMENTS FOR THIS PROPERTY. THESE SETBACK LINES ARE SUBJECT TO THE INTERPRETATION OF AN APPROPRIATE GOVERNMENTAL AGENCY (I.E. BUILDING INSPECTION OR PLANNING/ZONING).

- LEGEND**
- | | |
|---|--|
| ○ MAG NAIL WITH ID | —S— SIGNS |
| ○ WASHER (SET, PLS 3350) | —PVC— PLASTIC PIPE |
| ○ FOUND MONUMENT | —RCP— CONCRETE PIPE |
| ○ AS NOTED ON SURVEY | —MTL— METAL PIPE |
| ○ 24"-LONG, 5/8" DIAMETER REBAR WITH SURVEYOR'S CAP (SET, PLS 3350) | —VCP— VITRIFIED CLAY PIPE |
| ○ CONTROL POINT / BENCHMARK | —HW— STORM STRUCTURE HEADWALL |
| ○ LIGHT POLE (LP) | —MH— MANHOLE |
| ○ STREET LIGHT (LP) | —INV— INVERT ELEVATION |
| ○ FIRE HYDRANT (FH) | —F.L.— FLOW LINE ELEVATION |
| ○ POWER POLE (PP) | —T.G.— SURFACE ELEVATION (TOP-OF-GRATE) |
| ○ TELEPHONE POLE (TP) | —T.R.— SURFACE ELEVATION (TOP-OF-RIM) |
| ○ WATER VALVE (WV) | —FC— FACE OF CURB (ELEVATION AT GUTTER LINE) |
| ○ WATER METER (WM) | —- - - - - CHAIN LINK FENCE |
| ○ POST INDICATOR VALVE (PIV) | — - - - - ALUMINUM FENCE |
| ○ GAS METER (GM) | —W— WATER LINE |
| ○ GAS VALVE (GV) | —GAS— GAS LINE |
| ○ ELECTRIC METER (EM) | —OHE— OVERHEAD ELECTRIC |
| ○ SANITARY MANHOLE | —OHT— OVERHEAD TELEPHONE/CABLE |
| ○ STORM MANHOLE | —UGE— UNDERGROUND ELECTRIC |
| | —UGT— UNDERGROUND TELEPHONE/CABLE |
| | (99.9') BRACKETED DIMENSIONS ARE PER RECORD SOURCE |



ORIGIN OF COORDINATES

THE BEARINGS SHOWN HEREON ARE BASED ON KENTUCKY STATE PLANE GRID NORTH, NORTH AMERICAN DATUM OF 1983 (NAD 83). PARTICULARLY, THE BEARINGS ARE BASED ON A GPS SURVEY UTILIZING A TRIMBLE R8 GPS RECEIVER LINKED TO CONTINUOUSLY OPERATING REFERENCE STATION (CORS) "KYIG", HAVING A POINT DESIGNATION OF "KY HW DIST 7 CORS ARP" AND HAVING GEOGRAPHIC COORDINATES OF N 38° 04' 31.96484", W 084° 29' 31.91127" AND KENTUCKY STATE PLANE COORDINATES (NORTH ZONE, NAD 83) OF N=209,682.94', E=1,570,696.89'.

ORIGIN OF ELEVATIONS

THE ELEVATIONS SHOWN HEREON ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988. PARTICULARLY, THE ORIGIN OF ELEVATIONS IS THE CORS STATION "KYIG" DESCRIBED ABOVE. THE PUBLISHED ELEVATION OF THIS MONUMENT IS 978.93 FEET (NAVD 88).

FEMA FLOOD HAZARD AREA

BASED ON AN INSPECTION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S MAP NUMBER 2100670136E WITH A DATE OF REVISION OF MARCH 3, 2014 FOR COMMUNITY NUMBER 210067, LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, KENTUCKY, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP (FIRM) FOR THE COMMUNITY IN WHICH THE SUBJECT PROPERTY LIES, THE PROPERTY LIES IN ZONE ZONE "X" (UNSHADED). AREAS THAT HAVE BEEN DETERMINED TO BE OUTSIDE THE AREA OF 0.2% CHANCE OF ANNUAL FLOOD.

METHOD OF SURVEY

THIS GROUND SURVEY WAS PREPARED USING A TRIMBLE S-6 ROBOTIC TOTAL STATION. THE STATE PLANE COORDINATES SHOWN WERE DERIVED FROM A REAL-TIME SURVEY (VA CELLULAR COMMUNICATION) WITH THE "KYIG" CORS STATION LOCATED AT THE KDOT DISTRICT 7 OFFICE IN LEXINGTON, KY.

LAND SURVEYOR'S CERTIFICATION

I HEREBY DO CERTIFY THAT THIS SURVEY WAS PREPARED BY ME OR UNDER MY DIRECTION; AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE LOCATIONS AND ELEVATIONS SHOWN ARE TRUE AND ACCURATE. THE GROUND SURVEY UPON WHICH THIS MAP IS BASED WAS CONCLUDED ON MARCH 19, 2022.



05-03-2022
DATE

REVISION NUMBER	DATE	DESCRIPTION

771 ENTERPRISE DRIVE
LEXINGTON, KY 40510
TEL: 859.253.1436
FAX: 859.253.1436
EMAIL: info@endris.com

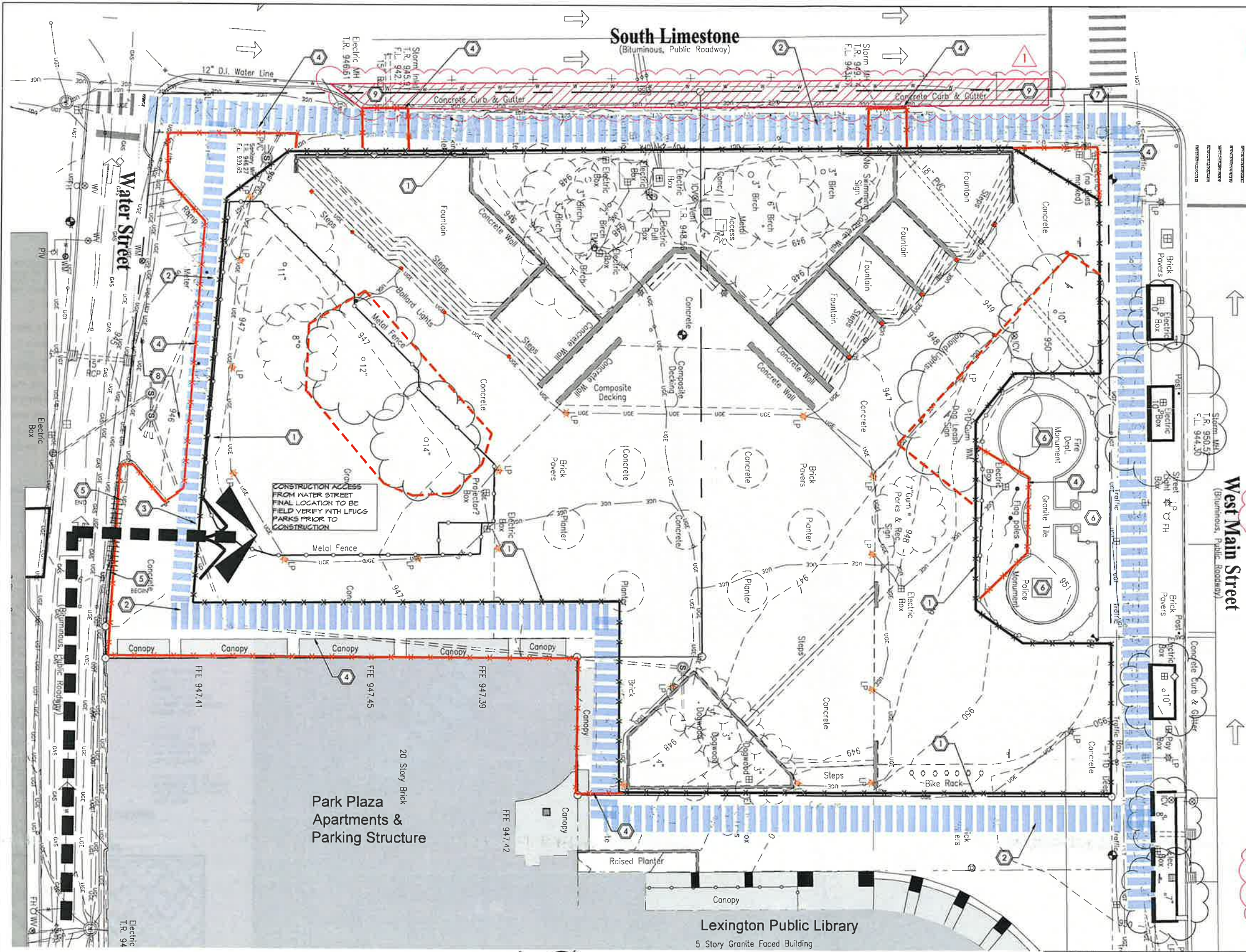
EE ENDRIS
engineering
Land Surveys • Construction Layout • GPS

TOPOGRAPHIC SURVEY OF
Phoenix Park
100 East Main Street & 110 South Limestone
Lexington, Fayette County, Kentucky 40503

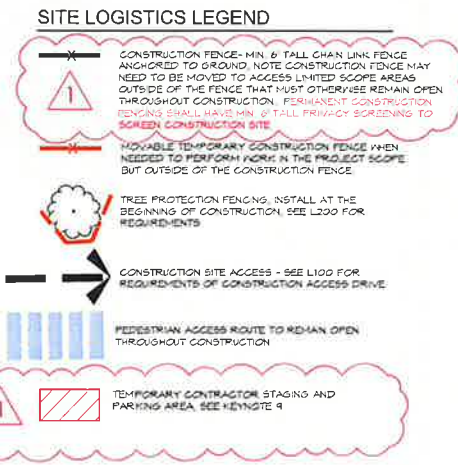
This Plot represents a boundary survey and complies with 201 KAR 19.120

SURVEY COMPLETED
March 19, 2022

JOB NUMBER 4668
DRAWING DATE 05-03-2022
DRAWING FILE 1668_Phoenix Park.dwg
SCALE: 1" = 20'



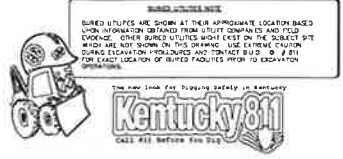
- SITE LOGISTICS NOTES:**
- THE EXISTING TOPOGRAPHIC AND SITE INFORMATION SHOWN HAS BEEN PROVIDED FROM A SURVEY BY ENDRIS ENGINEERS. THIS INFORMATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN. THE CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
 - THE CONTRACT DRAWINGS SHOW THE APPROXIMATE LOCATION OF EXISTING AND PROPOSED UTILITY LINES. THESE LINES HAVE BEEN IDENTIFIED AND LOCATED AS ACCURATELY AS POSSIBLE USING AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL UTILITY LOCATIONS.
 - LIMIT CONSTRUCTION ACCESS TO THE SITE TO THE LOCATION INDICATED AS AN ACCESS DRIVEWAY(S). TEMPORARY ACCESS DRIVEWAYS FOR CONSTRUCTION VEHICLES SHALL BE GRAVELED A MINIMUM OF 6" DEPTH WITH FILTER FABRIC PLACED BETWEEN SOFTENED STONE FOR A DISTANCE OF 100 FEET INTO THE SITE AND MAINTAINED IN GOOD CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. THE ACCESS DRIVE TO THE SITE SHALL BE MAINTAINED BY THE CONTRACTOR TO MINIMIZE THE ACCUMULATION OF MUD, DIRT, DUST AND OTHER DEBRIS CAUSED BY THE CONTRACTOR'S OPERATIONS. THE DRIVE SHALL BE CHECKED DAILY AND CLEANED BY THE CONTRACTOR AS REQUIRED TO MAINTAIN THIS CONDITION THROUGHOUT THE CONSTRUCTION PERIOD.
 - THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES AND AVAILABILITY OF SITES WITH THE CYBER PRIOR TO BEGINNING WORK AT ANY GIVEN SITE.
 - REFER TO L100 AND (IEPC PLANS) AND L000 FOR ADDITIONAL CONSTRUCTION PHASING NOTES AND REQUIREMENTS.
 - REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
 - SOME WORK WILL NEED TO OCCUR OUTSIDE OF THE CONSTRUCTION FENCE FOR THIS SCOPE. THE CONTRACTOR SHALL PROVIDE APPROPRIATE SIGNAGE AND MOVABLE FENCING TO SAFELY DIRECT PEDESTRIANS AROUND CONSTRUCTION WORK.



- SITE LOGISTICS KEYNOTES**
- CONSTRUCTION SITE FENCE ADJUST FENCE LOCATION AS NEEDED TO ACCOMMODATE CONSTRUCTION ACTIVITIES.
 - PEDESTRIAN ROUTES AROUND PROJECT SITE TO REMAIN OPEN. CLOSE ONLY AS NEEDED TO PERFORM WORK IN THE IMMEDIATE AREA. WHEN CLOSINGS ARE NEEDED, PROVIDE ALTERNATE PEDESTRIAN ROUTES WITH FENCING AND SIGNAGE TO DIRECT PEDESTRIANS SAFELY AROUND THE WORK.
 - SITE CONSTRUCTION ACCESS POINT WITH CONSTRUCTION ACCESS GATES. KEEP LOCKED EXCEPT FOR DELIVERIES TO THE SITE. DAILY CHAIN LINKS TO ALLOW EMERGENCY VEHICLE ACCESS THROUGHOUT CONSTRUCTION. PROVIDE SIGNAGE TO INDICATE TO PEDESTRIANS AND CONSTRUCTION TRAFFIC THAT BOTH WILL BE CROSSING. AT ALL TIMES WHEN CONSTRUCTION TRAFFIC IS ENTERING THE SITE, THE CONTRACTOR SHALL HAVE A FLAGSMAN OUT TO DIRECT PEDESTRIANS AND VEHICLES.
 - TEMPORARY CONSTRUCTION FENCE WHEN NEEDED TO PERFORM WORK IN THE PROJECT SCOPE BUT OUTSIDE OF THE CONSTRUCTION FENCE. NOTE: PROVIDE TEMPORARY FENCE AND TEMPORARY SIGNAGE DIRECTING PEDESTRIANS SAFELY AROUND WORK AREAS. DO NOT CLOSE ACCESS TO EXISTING BUSINESSES / DOORS AT PARK PLACE. PROVIDE SOME MEANS OF ACCESS TO DOORS AT ALL TIMES WHEN BUSINESSES ARE OPEN. PHASE WORK OUTSIDE OF CONSTRUCTION FENCE SO AS TO AVOID BLOCKING KEY PEDESTRIAN ROUTES DURING BUSINESS HOURS. NOTIFY OWNER OF INTENT TO MOVE CONSTRUCTION AREAS OUTSIDE OF FENCE MINIMUM 12 HOURS IN ADVANCE.
 - EXISTING GUARD RAIL TO BE PARTIALLY REMOVED TO FACILITATE CONSTRUCTION ACCESS. LEAVE MINIMUM 20' OF EXISTING GUARDRAIL IN PLACE FROM CORNER OF BUILDING WEST TO PREVENT PEDESTRIANS FROM WALKING OUT DIRECTLY INTO WATER STREET AT THE BUILD CORNER. GUARDRAIL TO BE REPLACED IN KIND AT THE CONCLUSION OF CONSTRUCTION.
 - ACCESS TO EXISTING POLICE AND FIRE MONUMENTS FROM MAIN STREET TO REMAIN OPEN. MONUMENTS TO REMAIN OPEN / IN USE AND NOT IMPACTED BY CONSTRUCTION THROUGHOUT CONSTRUCTION DURATION.
 - EXISTING MONUMENTS TO REMAIN IN PLACE AND OPEN TO THE PUBLIC INCLUDE MILEMARKER 0 MONUMENT, ROTARY CLUB MONUMENT, HISTORIC SIGNS. DO NOT REMOVE OR RELOCATE ANY MONUMENTS THIS AREA. REVIEW ON SITE WITH OWNER AT PRECONSTRUCTION CONFERENCE.
 - EXISTING PUBLIC PARKING SPACES ON WATER STREET MUST REMAIN OPEN TO THE PUBLIC DURING CONSTRUCTION (IF TOTAL PARKING SPACES).
 - EXISTING 8 PARKING SPACES AVAILABLE TO THE CONTRACTOR TO BE USED AS PART OF THE CONSTRUCTION STAGING AREA AS OF JUNE 1, 2022. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SIGNAGE TO INDICATE TO THE PUBLIC THAT THESE SPACES ARE PART OF THE CONSTRUCTION SITE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR ANY PERMITTING REQUIRED FOR TEMPORARY FENCE, CONES, BARRIERS ETC. AS THEY FEEL IS NEEDED TO KEEP OTHERS FROM PARKING IN THESE SPACES. ANY BARRIERS USED SHALL BE COMPLIANT WITH THE REQUIREMENTS OF LFUGG TRAFFIC ENGINEERING FOR TEMPORARY CONSTRUCTION BARRIERS AS THIS PART OF LIMESTONE STREET IS AN LFUGG STREET.

SITE LOGISTICS PLAN

SCALE 1" = 10'-0"



Date: April 8, 2024
 Drawn by: BMF / RDM
 Checked by: BMF / RDM
 Revision: 1 (Approved)
 Revision: 2
 Revision: 3

PHOENIX PARK REIMAGINED LFUGG PARKS AND RECREATION

100 East Main Street
 Lexington, KY

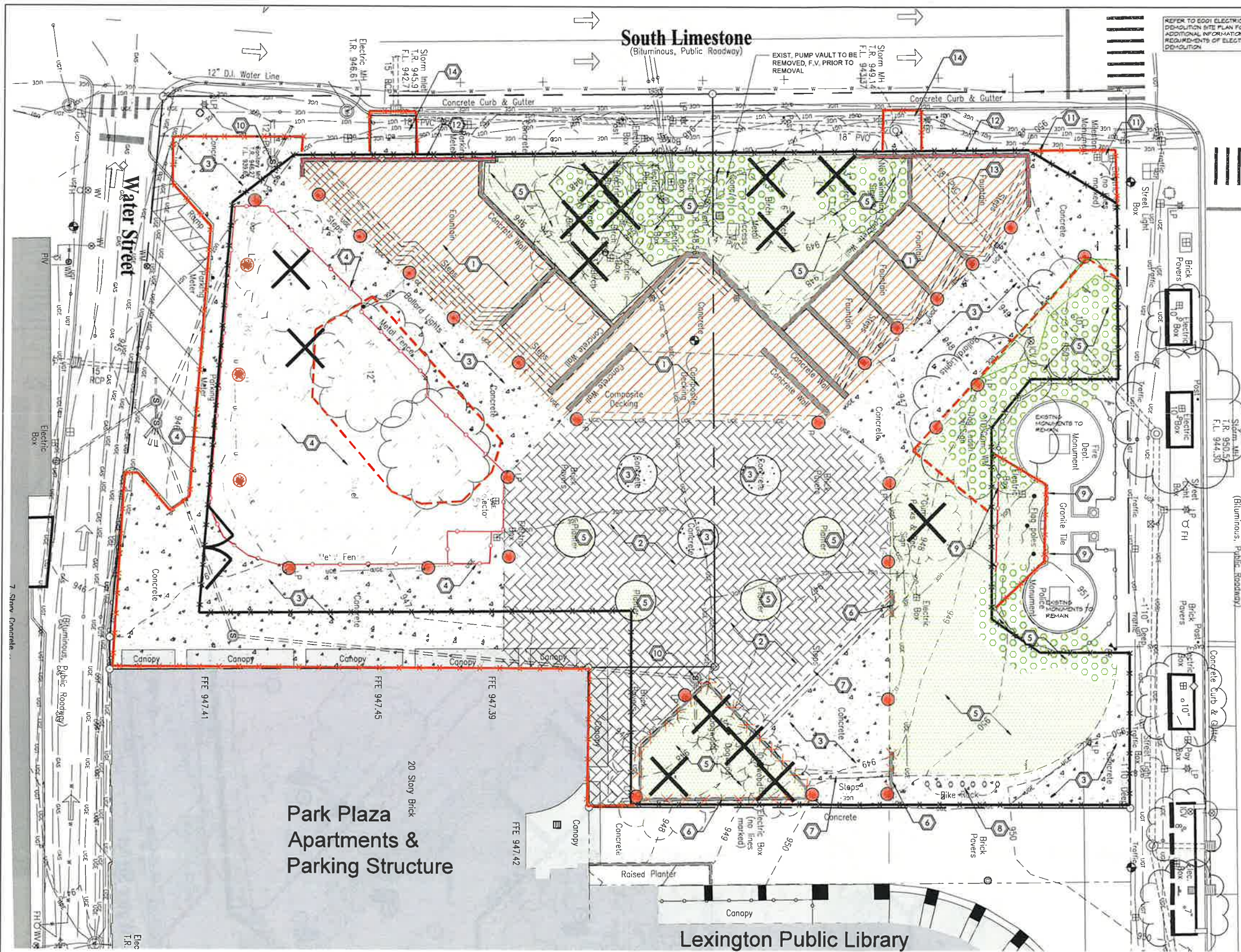
CONSULTANTS:
 Gresham Smith
 Landscape Architecture
 KFI Engineers
 Site Electrical Engineer

element design
 landscape architecture + civil engineering

Site Logistics Plan

Sheet Title

L000
 Drawing No.



- DEMOLITION NOTES:**
- THE EXISTING TOPOGRAPHIC AND SITE INFORMATION SHOWN HAS BEEN PROVIDED FROM A SURVEY BY ENDRIS ENGINEERING. THIS INFORMATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN THEREON. CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
 - THE CONTRACT DRAWINGS SHOW THE APPROXIMATE LOCATION OF EXISTING AND PROPOSED UTILITY LINES. THESE LINES HAVE BEEN IDENTIFIED AND LOCATED AS ACCURATELY AS POSSIBLE USING AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL UTILITY LOCATIONS.
 - SAVING EDGES OF EXISTING PAVEMENT WHERE NEW PAVEMENT ADJUTS AND / OR EXISTING PAVEMENT IS INDICATED TO BE REMOVED.
 - CONTRACTOR TO PROTECT ALL EXISTING TREES TO REMAIN. ALL TREES WITHIN THE LIMITS OF WORK SHALL BE PROTECTED. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT IF ANY TREES ARE DAMAGED ON OR OFF SITE. NO MATERIALS ARE TO BE STORED UNDER A TREE IN ANY CIRCUMSTANCE. THE CONTRACTOR SHALL MAINTAIN TREE PROTECTION FENCING WHERE INDICATED AND FOR ALL EXISTING TREES WITHIN THE LIMITS OF THE CONSTRUCTION FENCING. TREE PROTECTION FENCING SHALL BE CONSTRUCTED OF SAFETY FENCE WITH STAKE FENCE POSTS SPACED AT 8' MAXIMUM. LIMIT OF FENCE TO ALIGN WITH CANOPY / DRIP EDGE OF TREES TO AVOID DAMAGE TO EXISTING TREES DURING CONSTRUCTION.
 - CONTRACTOR SHALL PROTECT ALL SURROUNDING AREAS. CONTRACTOR SHALL REPAIR ANY DAMAGES TO OFF OR ON SITE PROPERTY THAT IS NOT LISTED TO BE REMOVED AT NO ADDITIONAL COST TO OWNER.
 - SEE SPECIFICATIONS FOR OTHER DEMOLITION AND SITE CLEARING REQUIREMENTS.
 - CONTRACTOR SHALL PROTECT ALL UTILITY STRUCTURES. ANY DAMAGES TO UTILITIES ON OR OFF SITE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR REPAIR AT NO ADDITIONAL COST TO OWNER. THE CONTRACTOR SHALL SALVAGE AND REINSTALL ALL EXISTING UTILITY MARKERS IN NEW PAVEMENT.
 - PROTECT ALL WALKWAYS, WALLS, VEGETATION, TREES AND OTHER IMPROVEMENTS WITHIN THE CONSTRUCTION LIMITS THAT ARE NOT INDICATED FOR REMOVAL. ANY DAMAGE OR DESTRUCTION OF SUCH SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.
 - WHERE ITEMS ARE INDICATED TO BE SALVAGED AND RETURNED TO OWNER, THE OWNER SHALL DESIGNATE A LOCATION FOR CONTRACTOR TO DELIVER AND OFFLOAD SALVAGED ITEMS.
 - FOR WORK SCOPE ITEMS OUTSIDE OF THE CONSTRUCTION FENCE, THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCE AND SIGNAGE TO DIRECT PEDESTRIANS AROUND CONSTRUCTION AREAS AS NEEDED FOR DEMOLITION AND CONSTRUCTION IN THESE AREAS. CONTRACTOR SHALL MINIMIZE THE DURATION OF WORK OUTSIDE OF THE CONSTRUCTION FENCE AS MUCH AS FEASIBLE AND SHALL NOTIFY OWNER OF ANY PROPOSED CHANGES TO THE CONSTRUCTION FENCE AND WORK OUTSIDE OF THE CONSTRUCTION FENCE A MINIMUM OF 12 HOURS IN ADVANCE.

- DEMOLITION KEYNOTES**
- EXISTING FOUNTAIN / WATER FEATURE TO BE DEMOLISHED. LOCATE AND REMOVE EXISTING PUMP VAULT, ELECTRICAL AND WATER SUPPLY. REMOVE VAULT AND HAUL OFFSITE FOR LEGAL DISPOSAL OF VAULT AND CHEMICAL TREATMENT SYSTEMS. BACKFILL WITH PROPOSED LANDSCAPE AREAS AND DOGA IN PROPOSED PAVEMENT AREAS. REMOVE ELECTRICAL SUPPLY, CUT AND CAP WATER SUPPLY. REMOVE WATER FEATURE WALLS INCLUDING FOOTINGS. REMOVE ADJACENT STEPS BREAK UP AND REMOVE CONCRETE BASH SLAB. DEMOLISHED CONCRETE MAY BE USED AS FILL MATERIAL IN LANDSCAPE AREAS. NO CLOSER THAN 24" TO THE SURFACE AND MUST BE CRUSHED TO NO GREATER THAN 6" DIA IN SIZE IN ANY DIRECTION. REMOVE ALSO ALL CONCRETE PAVEMENT AND COMPOSITE DECKING OVER EXISTING FOUNTAIN. HAUL ALL DESTRUCTIVE MATERIALS OFF SITE AND DISPOSE OF LEGALLY.
 - EXISTING BRICK / CONCRETE PAVEMENTS TO BE REMOVED. STONE BASE MAY BE LEFT IN PLACE AS FILL AT PROPOSED PAVEMENT AREAS. REMOVE MIN. 12" STONE BASE AT PROPOSED LANDSCAPE AREAS AND SCARIFY REMAINING BASE PRIOR TO PLACING NEW LANDSCAPE SOILS.
 - EXISTING CONCRETE PAVEMENT AND STONE BASE TO BE REMOVED. SAVED EXISTING CONCRETE AT NEAREST SCORE LINE. APPROXIMATE LOCATION OF NEAREST SCORELINE IS INDICATED HEREIN. FIELD VERIFY WITH OWNER AND LANDSCAPE ARCHITECT PRIOR TO REMOVAL.
 - EXISTING DOG LOT TO BE REMOVED IN ITS ENTIRETY. REMOVE PERIMETER & WIRE FENCING. SALVAGE PANELS AND GATES AND RETURN TO OWNER. REMOVE ALL GRAVEL SURFACING AND DISPOSE OF LEGALLY OFF SITE.
 - EXISTING LANDSCAPE AREA TO BE REMOVED OR RENOVATED. SEE HATCH IN LEGEND FOR TYPE. REMOVE TREES INDICATED FOR REMOVAL, AND LANDSCAPE PLANTINGS AND DISPOSE OF OFF SITE. EXISTING SOIL IN LANDSCAPE BED MAY BE SALVAGED AND STORED ON SITE AND USED IN NEW LANDSCAPE AREAS PER THE REQUIREMENTS OF LS600.
 - EXISTING SITE WALL (NOT ATTACHED TO EXISTING WATER FEATURE) TO BE REMOVED.
 - WALL AND FOUNDATIONS.
 - EXISTING CONCRETE STAIRS TO BE REMOVED.
 - EXISTING BIKE RACKS. REMOVE. SALVAGE AND RETURN TO OWNER.
 - AT EXISTING MONUMENTS TO REMAIN. REMOVE ONLY FENCE AND GRANITE CURB WHERE INDICATED. TO MAKE FUTURE PEDESTRIAN CONNECTION PER LS600 AND L400 SHEETS. CAREFULLY SALVAGE 4" ORNAMENTAL FENCE PANELS FOR REUSE AS INDICATED ON L402. SALVAGE ANY EXTRA FENCE PANELS AND GATEBARS AND RETURN TO OWNER.
 - EXISTING SANITARY MANHOLE AND SANITARY LINES TO REMAIN. PROTECT DURING CONSTRUCTION ACTIVITIES.
 - EXISTING MULTIPLE MONUMENTS AND MONUMENT SIGNS TO REMAIN. PROTECT FROM CONSTRUCTION ACTIVITIES.
 - EXISTING GUARDRAIL AT LIMESTONE ST. EDGE OF WATER FEATURE. TO BE REMOVED. FENCE AND FOOTINGS.
 - EXISTING LARGE BOULDERS IN WATER FEATURE TO BE SALVAGED AND REUSED ON SITE. SEE LS600 FOR AREAS OF NEW STONE IN LANDSCAPE BEDS.
 - EXISTING CONCRETE SIDEWALK AT LIMESTONE ST. TO BE REMOVED TO FACILITATE NEW UTILITY CONNECTIONS. PROVIDE TEMPORARY FENCING AND DIRECTIONAL SIGNAGE TO DIRECT PEDESTRIANS TO OTHER SIDE OF LIMESTONE WHILE WORK IS BEING PERFORMED IN THESE AREAS. MINIMIZE THE SIDEWALK IS CLOSED TO MAKE UTILITY CONNECTIONS AS MUCH AS FEASIBLE. COORDINATE WITH KAN FOR THEIR ACCESS TO INSTALL NEW WATER TAP IN THIS AREA. SALVAGE EXISTING BRICKS AT EDGE OF SIDEWALK TO REINSTALL BACK IN KIND AT THE CONCLUSION OF THIS WORK. REPLACE WITH NEW 4500 PSI CONCRETE SIDEWALK THAT MATCHES ADJACENT EXISTING SIDEWALK FINISH AND SIGHTING PATTERNS. PROVIDE E1 TO EACH SIDE. DONEL NEW SIDEWALK TO EXISTING PER E1 DETAIL.

**Park Plaza
Apartments &
Parking Structure**

Lexington Public Library

SITE DEMOLITION PLAN

SCALE 1" = 10'-0"

SITE DEMOLITION LEGEND

- | | | |
|--|--|--|
| EXISTING FOUNTAIN / WATER FEATURE TO BE REMOVED IN ITS ENTIRETY. SEE KEYNOTE 1 | EXISTING LAWN OR LANDSCAPE AREA TO BE RENOVATED TO NEW LANDSCAPE AREA. SEE LS600 | EXISTING SITE LIGHT TO BE REMOVED. REFER TO MEP DEMOLITION PLANS. PROVIDE TEMPORARY LIGHTING AS NEEDED TO KEEP WALKWAYS LIT FOR SAFETY. SEE ELECTRICAL SITE DEMOLITION PLAN FOR ADDITIONAL REQUIREMENTS. |
| EXISTING PAVERS AND STONE BASE TO BE REMOVED. SEE KEYNOTE 2 | EXISTING SITE WALL TO BE REMOVED. SEE KEYNOTE 6 | EXISTING TREE TO BE REMOVED. SEE KEYNOTES AND SPECIFICATIONS SITE CLEARING FOR ADDITIONAL REQUIREMENTS. |
| EXISTING CONCRETE PAVEMENT TO BE REMOVED. SEE KEYNOTE 3 | EXISTING UTILITY LINE TO BE REMOVED AND / OR RELOCATED. SEE KEYNOTES | EXISTING TREE TO BE PROTECTED. INSTALL TREE PROTECTION FENCING WHERE INDICATED AT A MINIMUM PER DETAIL D/L600. |
| EXISTING GRAVEL SURFACING IN DOG LOT TO BE REMOVED. SEE KEYNOTE 4 | EXISTING FENCE TO BE REMOVED. SEE KEYNOTES FOR TYPE | 6" CHAINLINK CONSTRUCTION FENCE ATTACHED TO GRADE. SEE NOTE J FOR ADDITIONAL REQUIREMENTS. |
| EXISTING LAWN OR LANDSCAPE AREA TO BE CLEARED, GRUBBED AND PREPARED FOR NEW NEW PAVEMENT | | MOVABLE TEMPORARY CONSTRUCTION FENCE WHEN NEEDED TO PERFORM WORK IN THE PROJECT SCOPE BUT OUTSIDE OF THE CONSTRUCTION FENCE |



Date: April 2024
 Drawn by:
 Checked by:
 Revision:
 Revision:
 Revision:

**PHOENIX PARK REIMAGINED
LFUGG PARKS AND RECREATION**

100 East Main Street
Lexington, KY

CONSULTANTS:
Gresham Smith
Landscape Architecture Collaborator

KFI Engineers
Site Electrical Engineer

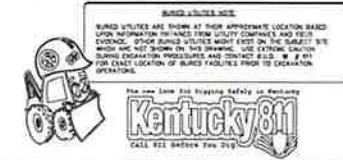
element design
landscape architecture + engineering

Site Demolition Plan

Sheet Title

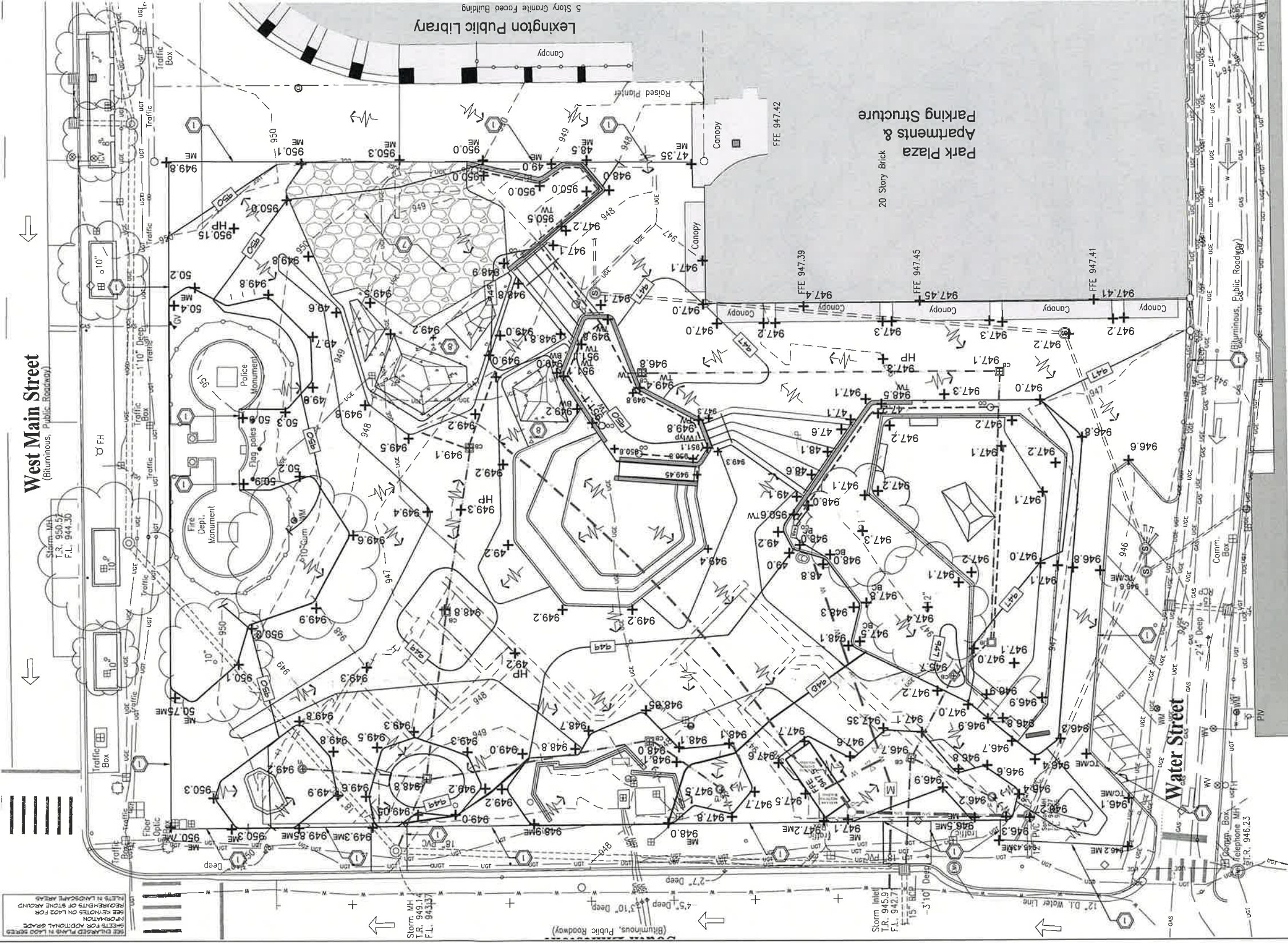
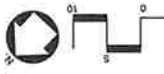
L200

Drawing No.



SITE GRADING PLAN

SCALE: 1" = 10'-0"



GRADING & DRAINAGE NOTES:

- A. THE EXISTING TOPOGRAPHIC AND SITE INFORMATION SHOWN IS INFORMATION SHOWN.
- B. THE DRAWINGS SHOW THE APPROXIMATE LOCATION OF EXISTING AND PROPOSED UTILITY LINES. THESE LINES HAVE BEEN DERIVED FROM A SURVEY PROVIDED BY THE ENGINEER. THE CONTRACTOR SHALL VERIFY ALL INFORMATION SHOWN.
- C. PROTECT EXISTING TREES FROM POTENTIAL DAMAGE OF CONSTRUCTION OPERATIONS. OTHER TREES SHALL REMAIN EXISTING UNLESS OTHERWISE INDICATED TO BE REMOVED.
- D. UNLESS OTHERWISE INDICATED TO BE REMOVED, ALL TREES REMAINING WITHIN THE LIMIT OF CONTRACT ARE TO REMAIN AND BE PROTECTED FROM DAMAGE DURING CONSTRUCTION.
- E. THE CONTRACTOR SHALL MAINTAIN STORM DRAINAGE SYSTEMS TO FUNCTION THROUGHOUT THE CONSTRUCTION PERIOD.
- F. PROPOSED GRADES SHOWN ARE FINISHED GRADES. ELEVATIONS SHOWN AT CORNERS AND BOTTOM OF CURBS UNLESS NOTED TO BE BOTTOM OF CURBS.
- G. LIMIT OF GRADING EXTERNS TO INCLUDE ALL AREAS DRAINING TO THE LOCATION OF PROPOSED SITE UTILITIES.
- H. REFER TO SPECIFICATION / PROJECT MANUAL FOR ADDITIONAL REQUIREMENTS.
- I. ADJUST RISE ELEVATIONS OF ALL EXISTING STRUCTURES TO MATCH PROPOSED FINISHED GRADES.
- J. GRADE ALL NEW PAVEMENTS TO DRAIN. GRADE ALL NEW WALKS AT WALK AND CURB LEVEL. GRADE ALL NEW WALKS TO MATCH 5% LONGITUDINAL SLOPE UNLESS OTHERWISE SPECIFICALLY INDICATED TO BE A RAMP.

GRADING & DRAINAGE LEGEND:

- 9630.0 + PROPOSED SPOT ELEVATION
- FIELD VERIFY
- TOP OF WALL
- MATCH EXISTING
- TOP OF CURB
- DRAINAGE DIRECTION
- NEW STORM LINE SEE DETAIL E1400
- NEW SUBDRYAN UNDER PAVEMENT OR BEHIND RETAINING WALL. SEE KEYNOTES 1 & 2.
- CLEANOUT. SEE DETAIL K1400
- NEW YARD INLET. SEE DETAIL G1400
- NEW CATCH BASIN. SEE DETAIL F1400 (SM)
- NEW JUNCTION BOX. SEE DETAIL F1400 (SM)
- AREA OF CONCRETE WOUNDS. SEE KEYNOTE 8
- AREA OF PLAYGROUND EQUIPMENT. SEE KEYNOTE 1
- BASE. SEE KEYNOTE 1

GRADING & DRAINAGE KEYNOTES:

1. MATCH EXISTING GRADES AT PAVEMENT EDGES.
2. NEW CATCH BASIN IN LANDSCAPE AREA OR CONCRETE PAVEMENT AREA WITH CAST IRON FRAME AND GRATE. SEE DETAIL F1400.
3. NEW SUBDRYAN AT PERIPHERAL PAVEMENTS. CONNECT TO NEW STORM SYSTEM WITH SOUP. USE PIPE MANUFACTURER'S STANDARD FITTINGS.
4. NEW SUBDRYAN BEHIND RETAINING WALL. CONNECT TO NEW STORM SYSTEM WITH SOUP. USE PIPE MANUFACTURER'S STANDARD FITTINGS.
5. SLEEVES THROUGH RETAINING WALL WITH 6" PVC SLEEVE BETWEEN REINFORCING STEEL. SEE RETAINING WALL DETAIL J1400 FOR SUBDRYAN REQUIREMENTS.
6. NEW CATCH BASIN IN PAVEMENT AREA WITH STAINLESS STEEL FRAME AND GRATE.
7. PLAYGROUND EQUIPMENT AREA BY OTHERS. CONTRACTOR SHALL BE RESPONSIBLE FOR BRACKING SUBGRADE TO 1" BELOW FINISH GRADES INDICATED. CONTRACTOR SHALL MAINTAIN ONE LIFT 4" THICK OF DECA N INSTALLER FOR THEIR ACCESS TO THE SITE SO PLAYGROUND VENDOR CAN INSTALL PLAYGROUND EQUIPMENT AND ALL PAVED IN PLACE SURFACING (PIP) INDICATED. NOTE PLAYGROUND EQUIPMENT AND PIP SHALL BE SCHEDULED AND INSTALLED WHEN MOST OTHER WORK IN THE VICINITY IS COMPLETE.
8. AREA OF CONCRETE WOUNDS TO BE INSTALLED BY CONTRACTOR. TOP OF CONCRETE SHALL BE 3" BELOW FINISH GRADES INDICATED TO ALLOW FOR INSTALLATION OF PIP SURFACING. PIP SURFACING BY PLAYGROUND INSTALLER AND IS NOT IN CONTRACT (NIC).
9. NEW 4" HOPE SUBDRYAN WITH FILTER SOCK IN STONE BELOW CONCRETE AND PAVEMENTS. SUBDRYAN TO COLLECT STORM WATER THAT MAY COLLECT THROUGH FLOOR HOLES BASE OPENINGS. SLOPE MIN. 2" PER FOOT AND CONNECT TO NEW STORM SYSTEM.

West Main Street
(Bituminous, Public Roadway)

Water Street
(Bituminous, Public Roadway)

Lexington Public Library
5 Story Granite Faced Building

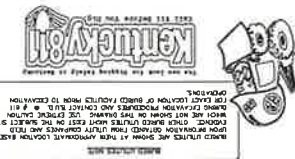
Park Plaza
20 Story Brick
Apartments & Parking Structure

Sheet Title
Grading Plan

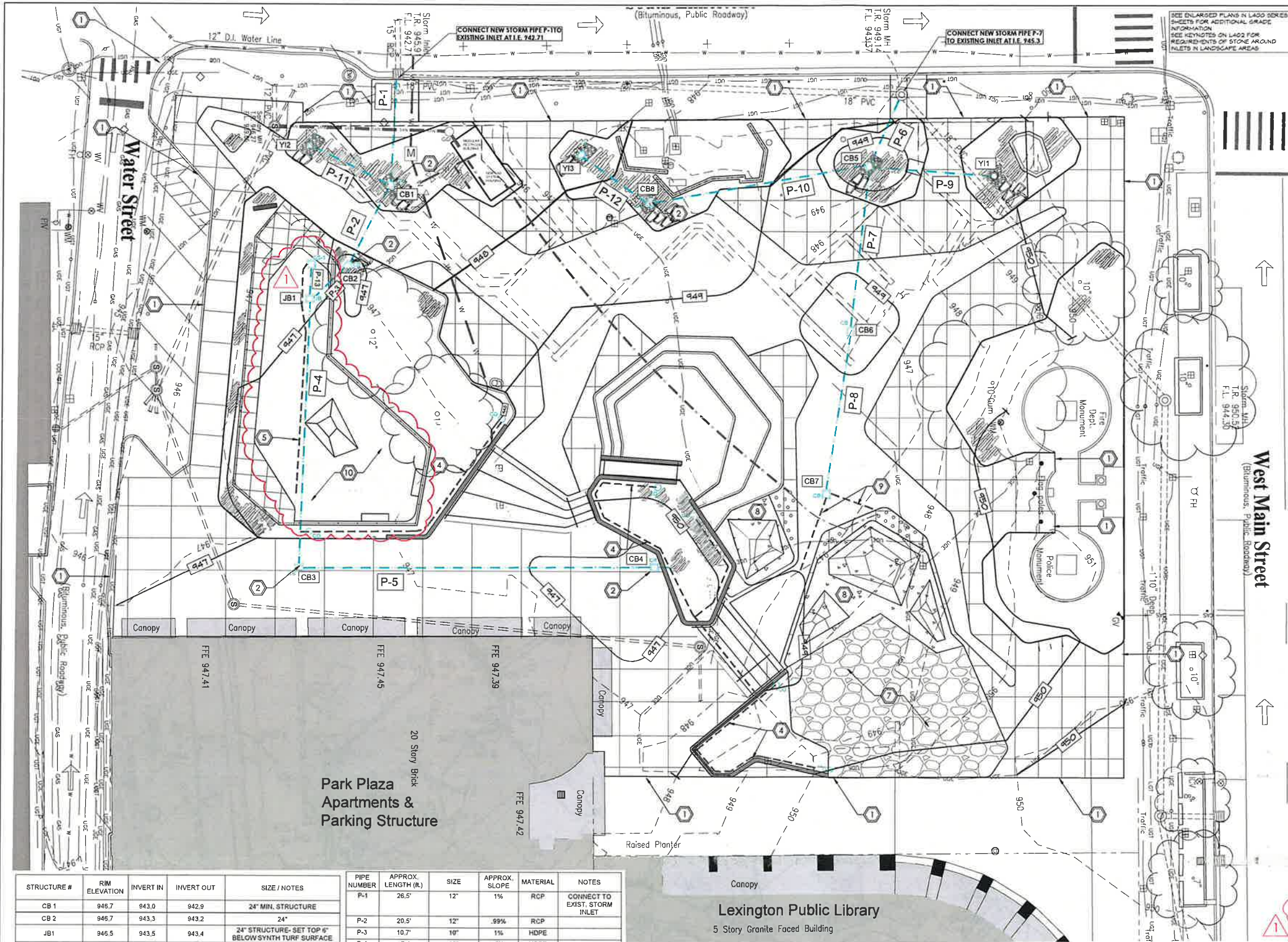
PHOENIX PARK REIMAGINED
100 East Main Street
Lexington, KY



CONSULTANTS:
Gresham Smith
Landscape Architecture Division
Checked By:
Drawn By:
Date: April 2024



Drawing No
L300



- ### GRADING & DRAINAGE NOTES:
- THE EXISTING TOPOGRAPHIC AND SITE INFORMATION SHOWN IS FROM A SURVEY PROVIDED BY ENDRIS ENGINEERING. THIS INFORMATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN THEREON. CONTRACTOR TO VERIFY ALL INFORMATION SHOWN CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
 - THE DRAWINGS SHOW THE APPROXIMATE LOCATION OF EXISTING AND PROPOSED UTILITY LINES. THESE LINES HAVE BEEN IDENTIFIED AND LOCATED AS ACCURATELY AS POSSIBLE USING AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL LOCATIONS.
 - PROTECT EXISTING TREES FROM POTENTIAL DAMAGE OF CONSTRUCTION OPERATIONS. STEEPEN GRADES UPHILL FROM EXISTING TREES TO A MAX. OF 2:1 TO AVOID FILLING SOILS ONTO TRUNKS.
 - UNLESS OTHERWISE INDICATED TO BE REMOVED, ALL ITEMS REMAINING WITHIN THE LIMIT OF CONTRACT ARE TO REMAIN AND BE PROTECTED FROM DAMAGE DURING CONSTRUCTION.
 - THE CONTRACTOR SHALL MAINTAIN STORM DRAINAGE SYSTEMS TO FUNCTION THROUGHOUT THE CONSTRUCTION PERIOD.
 - PROPOSED GRADES SHOWN ARE FINISHED GRADES. ELEVATIONS SHOWN AT CURBS ARE BOTTOM OF CURB UNLESS NOTED TO.
 - LIMIT OF GRADING EXTENTS TO INCLUDE ALL AREAS DISTURBED BY ALL SITE UTILITY WORK. REFER TO SITE UTILITY DRAWINGS FOR LOCATIONS OF PROPOSED SITE UTILITIES.
 - REFER TO SPECIFICATION / PROJECT MANUAL FOR ADDITIONAL REQUIREMENTS.
 - ADJUST RM ELEVATIONS OF ALL EXISTING STRUCTURES TO MATCH PROPOSED FINISHED GRADES.
 - GRADE ALL NEW PAVEMENTS TO DRAIN. GRADE ALL NEW WALKS AT MAX 2% CROSS SLOPE. GRADE ALL NEW PAVES TO MAX 5% LONGITUDINAL SLOPE UNLESS OTHERWISE SPECIFICALLY INDICATED ON PLANS TO BE A RAMP.

- ### GRADING & DRAINAGE LEGEND
- PROPOSED CONTOUR
 - PROPOSED SPOT ELEVATION
 - FIELD VERIFY
 - BOTTOM OF WALL
 - TOP OF WALL
 - MATCH EXISTING
 - TOP OF CURB
 - BOTTOM OF CURB
 - DRAINAGE DIRECTION
 - NEW STORM LINE SEE DETAIL E/L600
 - NEW SUBDRAN UNDER PAVEMENT OR BEHIND RETAINING WALL. SEE KEYNOTES FOR TYPE AND SIZE
 - CLEANOUT. SEE DETAIL H/L600
 - NEW YARD INLET. SEE DETAIL G/L600
 - NEW CATCH BASIN. SEE DETAIL F/L600
 - NEW JUNCTION BOX. SEE DETAIL F/L600 (5M)
 - AREA OF CONCRETE MOUNDS. SEE KEYNOTE 8
 - AREA OF PLAYGROUND EQUIPMENT. STONE BASE SEE KEYNOTE 7

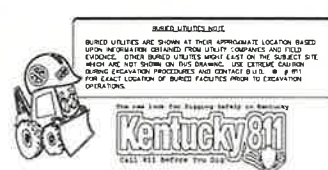
- ### GRADING & DRAINAGE KEYNOTES
- MATCH EXISTING GRADES AT PAVEMENT EDGES.
 - NEW CATCH BASIN IN LANDSCAPE AREA OR CONCRETE PAVEMENT AREA, WITH CAST IRON FRAME AND GRATE. SEE DETAIL F/L600.
 - 6" HDPE SUBDRAN AT PERMEABLE PAVERS. CONNECT TO NEW STORM SYSTEM WITH SOLID 8" HDPE PIPE. USE PIPE MANUFACTURER'S STANDARD FITTINGS.
 - 4" HDPE SUBDRAN BEHIND RETAINING WALL. CONNECT TO NEW STORM SYSTEM WITH SOLID 4" HDPE PIPE. USE PIPE MANUFACTURER'S STANDARD FITTINGS. SLEEVE THROUGH RETAINING WALL WITH 6" PVC SLEEVE BETWEEN REINFORCING STEEL. SEE RETAINING WALL DETAIL J/L600 FOR SUBDRAN REQUIREMENTS.
 - 4" HDPE SUBDRAN AT NEW DOG LOT.
 - NEW CATCH BASIN IN PAVEMENT AREA WITH STAINLESS STEEL FRAME AND GRATE. SEE DETAIL F/L600.
 - PLAYGROUND EQUIPMENT AREA BY OTHERS. CONTRACTOR SHALL BE RESPONSIBLE FOR BRINGING SUBGRADE TO -7" BELOW FINISH GRADES INDICATED. CONTRACTOR SHALL THEN INSTALL ONE LIFT 4" THICK OF DGA IN THIS AREA. CONTRACTOR SHALL COORDINATE WITH PLAYGROUND EQUIPMENT INSTALLER FOR THEIR ACCESS TO THE SITE SO PLAYGROUND VENDOR CAN INSTALL PLAYGROUND EQUIPMENT AND ALL POURED IN PLACE SURFACING (PIP) INDICATED. NOTE PLAYGROUND EQUIPMENT AND PIP SHALL BE SCHEDULED AND INSTALLED WHEN MOST OTHER WORK IN THE VICINITY IS COMPLETE.
 - AREA OF CONCRETE MOUNDS TO BE INSTALLED BY CONTRACTOR. TOP OF CONCRETE SHALL BE 3" BELOW FINISH GRADES INDICATED TO ALLOW FOR INSTALLATION OF PIP SURFACING. PIP SURFACING BY PLAYGROUND INSTALLER AND IS NOT IN CONTRACT (N/C).
 - NEW 4" HDPE SUBDRAN WITH FILTER SOCK IN STONE BELOW CONCRETE AND PAVERS. SUBDRAN TO COLLECT STORM WATER THAT MAY COLLECT THROUGH FOG NOZZLE BASE OPENINGS. SLOPE MIN. 1/8" PER FOOT AND CONNECT TO NEW CB-7.
 - 10" #3 STONE DEPTH OF 36" BELOW DOG LOT SURFACING / STONE FOR DETENTION. INVERT OF #51 STONE SHALL BE AT 944.1.

STRUCTURE #	RIM ELEVATION	INVERT IN	INVERT OUT	SIZE / NOTES	PIPE NUMBER	APPROX. LENGTH (L)	SIZE	APPROX. SLOPE	MATERIAL	NOTES
CB 1	946.7	943.0	942.9	24" MIN. STRUCTURE	P-1	26.5'	12"	1%	RCP	CONNECT TO EXIST. STORM INLET
CB 2	946.7	943.3	943.2	24"	P-2	20.5'	12"	.99%	RCP	
JB 1	946.5	943.5	943.4	24" STRUCTURE. SET TOP 6" BELOW SYNTH TURF SURFACE	P-3	10.7'	10"	1%	HDPE	
CB 3	947.1	944.0	943.9	18"	P-4	67.4	10"	.5%	HDPE	
CB 4	946.8	-	944.5	18"	P-5	89'	10"	.56%	HDPE	
CB 5	948.8	945.5	945.4	24"	P-6	18'	12"	.55%	RCP	CONNECT TO EX. STORM INLET
CB 6	948.8	945.81	945.71	24"	P-7	41'	12"	.5%	RCP	
CB 7	949.1	-	946.01	24"	P-8	40'	12"	.5%	RCP	
Y11	949.2	-	946.8	15"	P-9	30.25'	8"	4%	HDPE	
CB 8	948.0	945.9	945.8	24"	P-10	56'	12"	.54%	RCP	
Y12	946.20	-	943.11	15"	P-11	21'	8"	.5%	HDPE	
Y13	947.5	-	946.0	15"	P-12	20'	8"	.5%	HDPE	
OS-1	946.5	945	945	PARTIAL OPEN BOTTOM WEIR WALL WITH ORIFICE SEE DETAIL	P-13	7'	4"	22%	HDPE	

NOTE: ALL PIPE LENGTHS ARE APPROXIMATE AND ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. CONTRACTOR TO FIELD VERIFY LENGTHS AND SLOPES NEED TO MEET THE REQUIREMENTS OF THE STORM SYSTEM AS INDICATED. FOR ALL PIPE MATERIALS INDICATED AS "PIPE", CONTRACTOR SHALL USE RCP FOR PIPES 12" AND LARGER AND HDPE FOR PIPES LESS THAN 12". WHERE MATERIAL IS SPECIFIED IN THE CHART ABOVE, THE CONTRACTOR IS TO USE THAT MATERIAL.

SITE DRAINAGE PLAN

SCALE 1" = 10'-0"



Date: APR 8, 2024
 Drawn by: RAF / RDM
 Checked by: RAF / RDM
 Revision: ATG/2/2024
 Revision:
 Revision:

PHOENIX PARK REIMAGINED
LFUGG PARKS AND RECREATION

100 East Main Street
 Lexington, KY

CONSULTANTS:
 Gresham Smith
 Landscape Architecture Collaborative

KFI Engineers
 Site Electrical Engineer

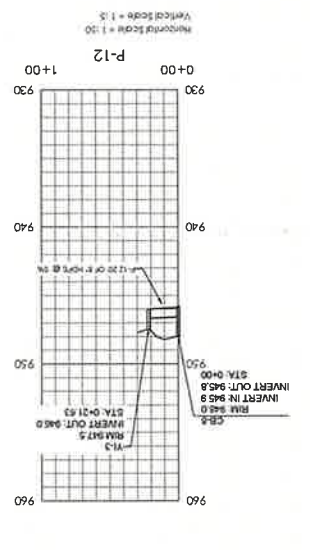
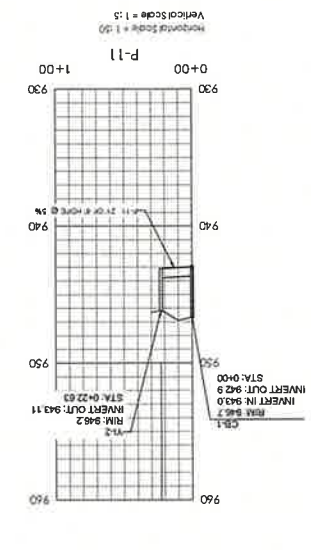
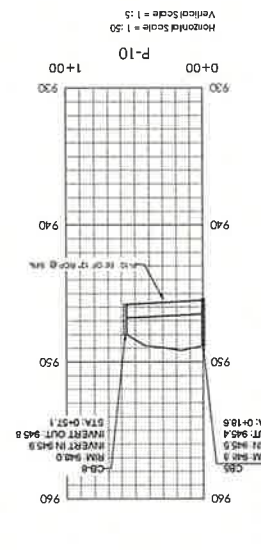
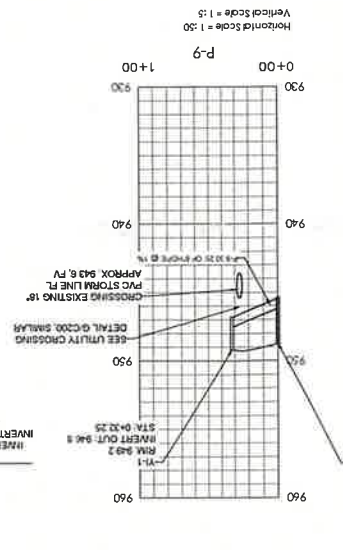
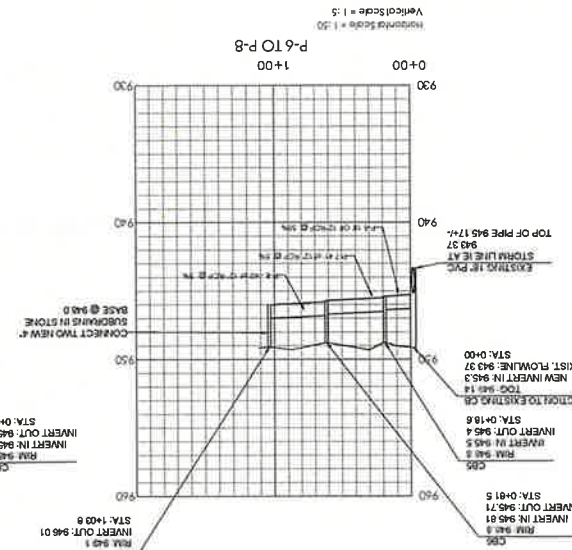
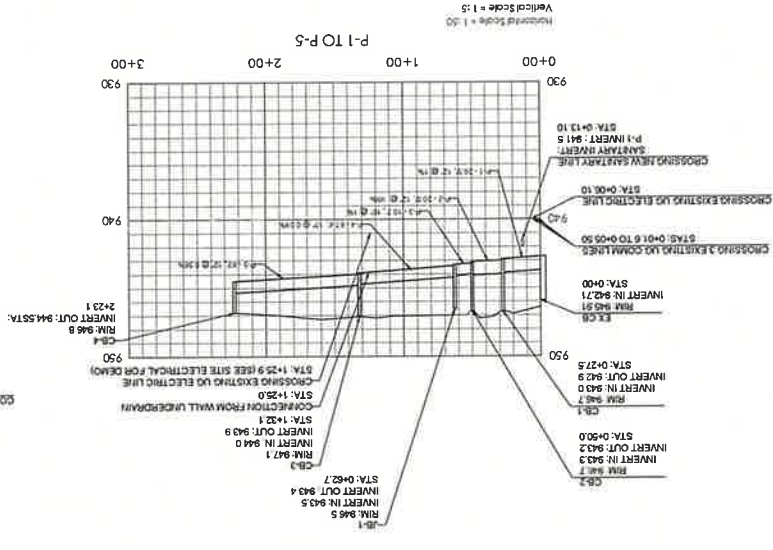
element design
 Landscape Architecture & Planning

Site Drainage Plan

Sheet Title

L301
 Drawing No.

STORM PIPE PROFILES



Date: April 8, 2024
 Drawn By:
 Checked By:
 Revision:
 Revision:
 Revision:
 Revision:
 Revision:
 KFI Engineers
 CONSULTANTS:
 Gresham Smith
 100 East Main Street
 Lexington, KY



Drawing No. L302

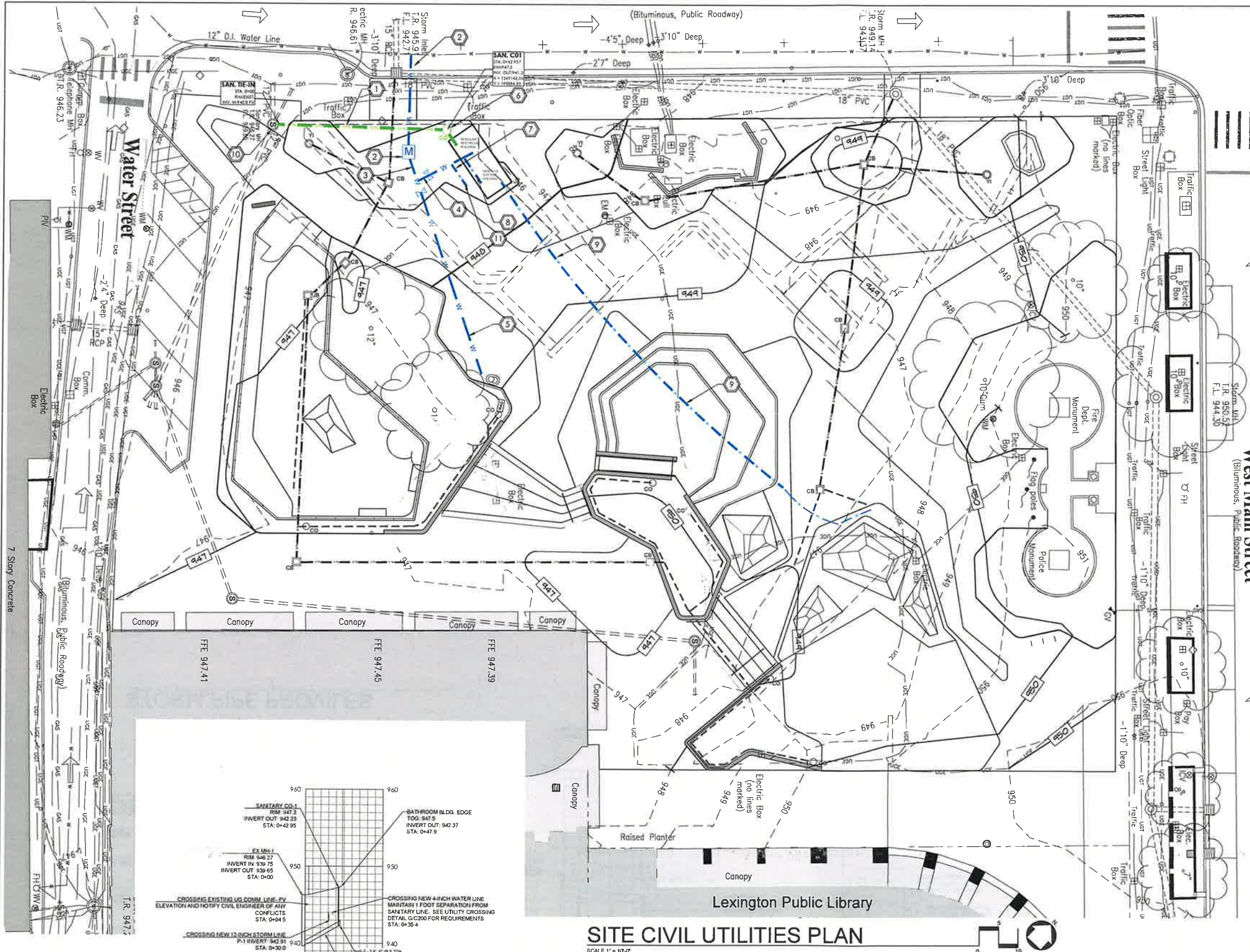
Drawings shall be the responsibility of the engineer who shall be held responsible for the accuracy of the information provided. The engineer shall be held responsible for the accuracy of the information provided. The engineer shall be held responsible for the accuracy of the information provided.

PHOENIX PARK REIMAGINED
 LFUGG PARKS AND RECREATION
 100 East Main Street
 Lexington, KY

Storm Profiles
 Sheet T-01a



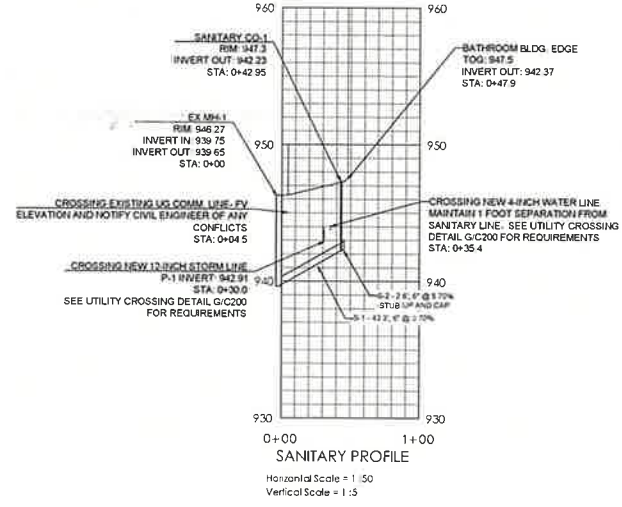
811 is a free service that allows you to call and report any underground utilities that may be in the way of your project. This service is available 24/7 and is available in all areas of the state. For more information, visit www.ky811.com.



- CIVIL UTILITY NOTES:**
- A. THE EXISTING TOPOGRAPHIC AND SITE INFORMATION SHOWN HAS BEEN PROVIDED BY ENGINEERING. THIS INFORMATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN THEREIN. CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
 - B. THE DRAWINGS SHOW THE APPROXIMATE LOCATION OF EXISTING AND PROPOSED UTILITY LINES. THESE LINES HAVE BEEN IDENTIFIED AND LOCATED AS ACCURATELY AS POSSIBLE USING AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL LOCATIONS.
 - C. UNLESS OTHERWISE INDICATED TO BE REMOVED, ALL ITEMS REMAINING WITHIN THE LIMIT OF CONTRACT ARE TO REMAIN AND BE PROTECTED FROM DAMAGE DURING CONSTRUCTION.
 - D. THE CONTRACTOR SHALL MAINTAIN UTILITY SYSTEMS TO FUNCTION THROUGHOUT THE CONSTRUCTION PERIOD.
 - E. REFER TO SPECIFICATION / PROJECT MANUAL FOR ADDITIONAL REQUIREMENTS.
 - F. ADJUST RM ELEVATIONS OF ALL EXISTING STRUCTURES TO MATCH PROPOSED FINISHED GRADES.
 - G. FOR PROPOSED UTILITY STRUCTURES, INVERT ELEVATIONS ARE APPROXIMATE AND BASED ON INFORMATION PROVIDED FOR EXISTING STRUCTURES. FIELD VERIFY ELEVATIONS PRIOR TO INSTALLATION OF UTILITY STRUCTURES.
 - H. FOR PROPOSED UTILITY PIPE, PIPE LENGTHS & SLOPES ARE APPROXIMATE & SHOULD BE FIELD VERIFIED.
 - I. PROVIDE THRUST BLOCKS AT ALL BENDS AND TEES IN WATER LINE. REFER TO DETAIL D/C200.
 - J. REFER TO MEP PLANS TO COORDINATE SPECIFIC UTILITY TE-IN LOCATIONS WITHIN 5' OF BUILDING FOOTPRINT.
 - K. EXPLORATION TO CONFIRM EXISTING UTILITY LOCATIONS IS CONSIDERED INCIDENTAL.
 - L. ALL ITEMS ON THIS SHEET REQUIRING POWER SHALL BE SUPPLIED POWER BY THE CONTRACTOR REGARDLESS OF THEIR INCLUSION IN MEP PORTION OF THE PLANS.
 - M. CONTRACTOR SHALL COORDINATE ALL UTILITY CROSSINGS AND IDENTIFY POTENTIAL CONFLICTS PRIOR TO BEGINNING INSTALLATION OF UTILITIES.
 - N. ANY EXISTING BRICK SANITARY OR STORM MANHOLES THAT ARE TO BE CONNECTED TO SHALL BE REPLACED WITH A NEW CONCRETE MANHOLE.
 - O. ANY POINT WHERE POTABLE WATER LINES AND SANITARY SEWER LINES ARE WITHIN 10 FEET HORIZONTALLY AND LESS THAN 10 INCHES OF VERTICAL SEPARATION EXIST, BOTH THE WATER AND SANITARY SEWER SHALL BE CONCRETE ENCASED 8 INCHES AROUND THE OUTSIDE OF THE PIPE.
 - P. ALL ELEVATIONS FOR UTILITIES SHALL BE VERIFIED AND CROSSINGS COORDINATED PRIOR TO ANY INSTALLATION OCCURRING. BEGINNING AND ENDING POINT ELEVATIONS SHALL BE VERIFIED AND NECESSARY SLOPES CONFIRMED PRIOR TO ANY INSTALLATION OCCURRING.
 - Q. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LUGS ENGINEERING AND WATER QUALITY FOR ALL REQUIRED STORM AND SANITARY INSPECTIONS.

- CIVIL UTILITY LEGEND:**
- PROPOSED SANITARY SEWER MANHOLE
 - PROPOSED SANITARY SEWER CLEANOUT - SEE MEP PLANS FOR CLEANOUT & CONTINUATION
 - PROPOSED SANITARY SEWER PIPE - PVC, SEE DETAILS G/C200
 - PROPOSED POTABLE WATER LINE - PEK TYPE A, SEE KEYNOTES & DETAIL A/C200
 - PROPOSED STORM LINE - SEE L301 FOR REQUIREMENTS
 - PROPOSED STORM SUBDRAIN - SEE L300 FOR REQUIREMENTS
 - PROPOSED WATER LINE GATE VALVE - SEE DETAIL B/C200
 - PROPOSED DOMESTIC WATER METER BY KENTUCKY AMERICAN WATER

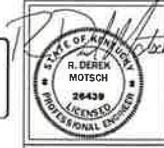
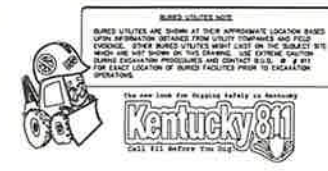
- CIVIL UTILITY KEYNOTES:**
1. NEW 4" PVC SANITARY SEWER LINE TO NEW MODULAR RESTROOM BUILDING. RESTROOM BUILDING AND INSTALLATION ARE INCLUDED BY ALLOWANCE. REFER TO COVER FOR ALLOWANCE NO. 1 NOTES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SANITARY, WATER AND ELECTRICAL SERVICE TO THE BUILDING AND FOR CONSTRUCTION OF THE CONCRETE BUILDING PAD. CONTRACTOR SHALL BE RESPONSIBLE FOR BRINGING LINE UP THROUGH PAD AND CAPPING. MODULAR RESTROOM MANUFACTURER TO MAKE FINAL CONNECTIONS AT RESTROOM BUILDING INSTALLATION.
 2. NEW 2" PEK A WATER SERVICE TO SERVE PARK. TAP AND METER SHALL BE BY KENTUCKY AMERICAN WATER. CONTRACTOR SHALL COORDINATE WITH KAW FOR ACCESS AND SCHEDULE. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF ALL WATER LINES PAST THE METER.
 3. NEW 2" PEK A WATER LINE PAST METER.
 4. NEW 2" PEK A DOMESTIC WATER SERVICE TO MODULAR RESTROOM PAD. VERIFY FINAL LINE SIZE WITH MODULAR RESTROOM BUILDING MANUFACTURER PRIOR TO INSTALLATION OF LINE. CONTRACTOR SHALL BE RESPONSIBLE FOR BRINGING LINE UP THROUGH PAD AND CAPPING. MODULAR RESTROOM MANUFACTURER TO MAKE FINAL CONNECTIONS AT RESTROOM BUILDING INSTALLATION.
 5. NEW 3/4" PEK A DOMESTIC WATER SERVICE TO NEW DRINKING FOUNTAIN. DRINKING FOUNTAIN SHALL BE OWNER PROVIDED AND CONTRACTOR INSTALLED.
 6. NEW SANITARY CLEANOUT OUTSIDE OF RESTROOM BUILDING PAD, SEE DETAIL F/C200.
 7. NEW 2" PEK A WATER LINE TO LANDSCAPE IRRIGATION SYSTEM. SEE IRRIGATION PLANS FOR ADDITIONAL REQUIREMENTS. SEE L502 FOR IRRIGATION REQUIREMENTS.
 8. NEW 1" PEK A WATER SUPPLY LINE TO NEW PUMP VAULT FOR FOG SYSTEM. SEE FOG SYSTEM DRAWINGS FOR REQUIREMENTS.
 9. NEW WATER LINE SERVICE TO FOG SYSTEM. SEE FOG SYSTEM DRAWINGS IN L400 SERIES DRAWINGS AND L400 FOR REQUIREMENTS.
 10. NEW CONNECTION TO EXISTING CITY SANITARY SEWER MANHOLE. INSTALL PER REQUIREMENTS OF LUGS ENGINEERING. COORDINATE WITH LUGS ENGINEERING FOR INSPECTION OF CONNECTIONS AND INSTALLATION OF LINES.
 11. NEW 1" PEK A WATER LINE FOR IRRIGATION SYSTEM. SEE L502 AND L503 FOR REQUIREMENTS.



SANITARY PROFILE

SITE CIVIL UTILITIES PLAN

SCALE 1" = 10'-0"



Date: April 8, 2024
 Drawn by:
 Checked by:
 Revision:
 Revision:
 Revision:

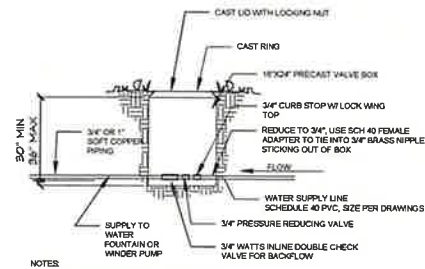
CONSULTANTS:
 Gresham Smith
 Landscape Architecture Collaborative
 KFI Engineers
 Site Electrical Engineer

PHOENIX PARK REIMAGINED
LFUGG PARKS AND RECREATION
 100 East Main Street
 Lexington, KY

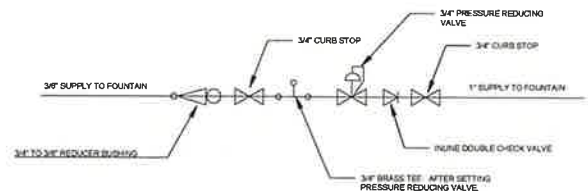


Site Civil Utilities Plan
 Sheet Title

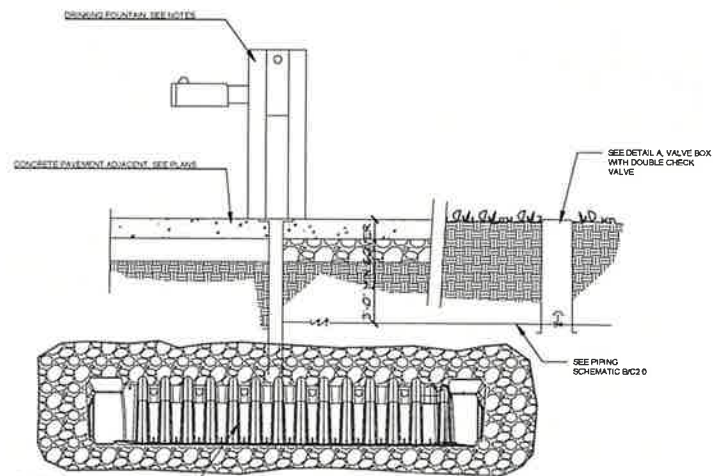
C100
 Drawing No.



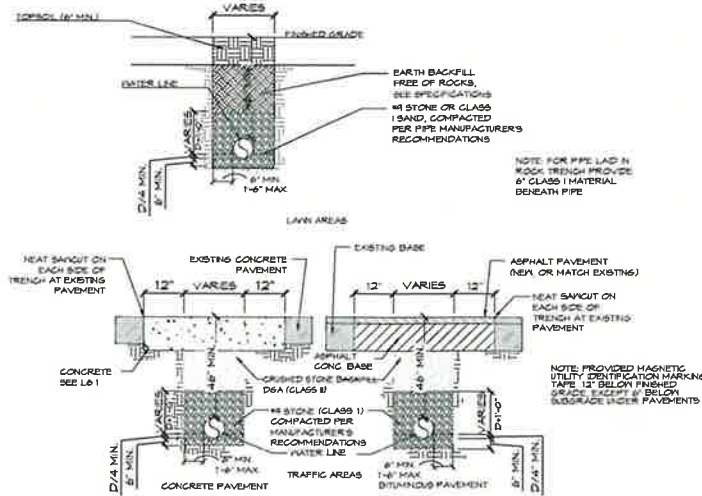
VALVE BOX WITH DOUBLE CHECK VALVE FOR DRINKING FOUNTAIN
N.T.S.



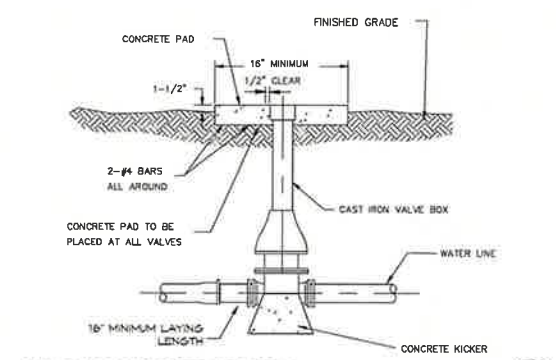
DRINKING FOUNTAIN - SCHEMATIC PIPING ENLARGEMENT
N.T.S.



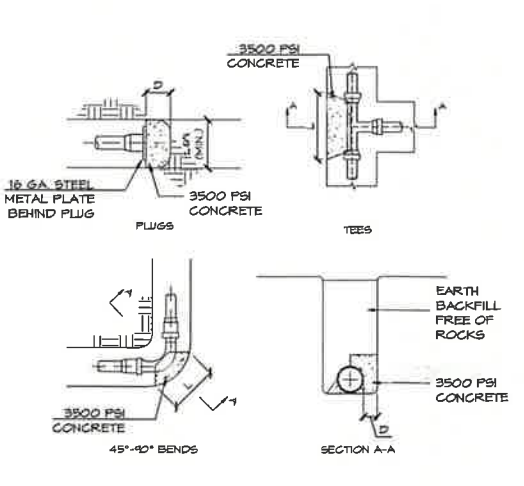
DRINKING FOUNTAIN INSTALLATION
N.T.S.



POTABLE WATER PIPE BEDDING
N.T.S.



TYPICAL VALVE SETTING DETAIL
N.T.S.



TYPICAL THRUST BLOCKING DETAIL
N.T.S.

PLUGS

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
D	6"	8"	8"	8"	8"	10"	10"	12"	14"	16"	20"
L	4"	6"	6"	10"	21"	30"	36"	42"	48"	54"	60"

PLUGS

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
D	6"	8"	8"	8"	8"	8"	8"	12"	14"	20"	32"
L	14"	16"	16"	20"	22"	24"	24"	24"	30"	30"	36"

THIRTY-SECOND BENDS (11-1/4")

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
D	6"	6"	8"	8"	10"	10"	12"	14"	16"	18"	20"
L	15"	16"	21"	24"	27"	30"	34"	36"	36"	42"	42"
T	10"	12"	14"	16"	16"	20"	22"	25"	24"	30"	36"

QUARTER BENDS (90°)

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
D	6"	6"	8"	8"	10"	10"	12"	12"	16"	18"	20"
L	15"	16"	21"	24"	27"	30"	34"	34"	36"	36"	42"
T	10"	12"	14"	16"	16"	20"	22"	25"	24"	30"	36"

EIGHTH BENDS (45°)

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
D	6"	6"	8"	8"	10"	10"	12"	12"	16"	18"	20"
L	15"	16"	21"	24"	27"	30"	34"	34"	36"	36"	42"
T	10"	12"	14"	16"	16"	20"	22"	25"	24"	30"	36"

QUARTER BENDS (90°)

SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"
D	6"	6"	8"	8"	10"	10"	12"	12"	16"	18"	20"
L	15"	16"	21"	24"	27"	30"	34"	34"	36"	36"	42"
T	10"	12"	14"	16"	16"	20"	22"	25"	24"	30"	36"



PHOENIX PARK REIMAGINED
LFUCG PARKS AND RECREATION

100 East Main Street
Lexington, KY

Site Water
Details

Sheet Title

Date: April 8, 2024
Drawn by:
Checked by:
Revision:
Revision:
Revision:

CONSULTANTS:
Gresham Smith
Landscape Architecture Collaborator

KFI Engineers
Site Electrical Designer

element design
landscape architecture • engineering

C300
Drawing No.

Drawing No. **L400**



CONSULTANTS:
 Gresham Smith
 Landscape Architecture Collaborative
 KFI Engineers
 Site Architect/Engineer

DATE:	April 8, 2024
DRAWN BY:	
CHECKED BY:	
REVISION:	
REVISION:	
REVISION:	

Sheet Title
Enlarged Plan Key

PHOENIX PARK REIMAGINED
LFUGG PARKS AND RECREATION
 100 East Main Street
 Lexington, KY

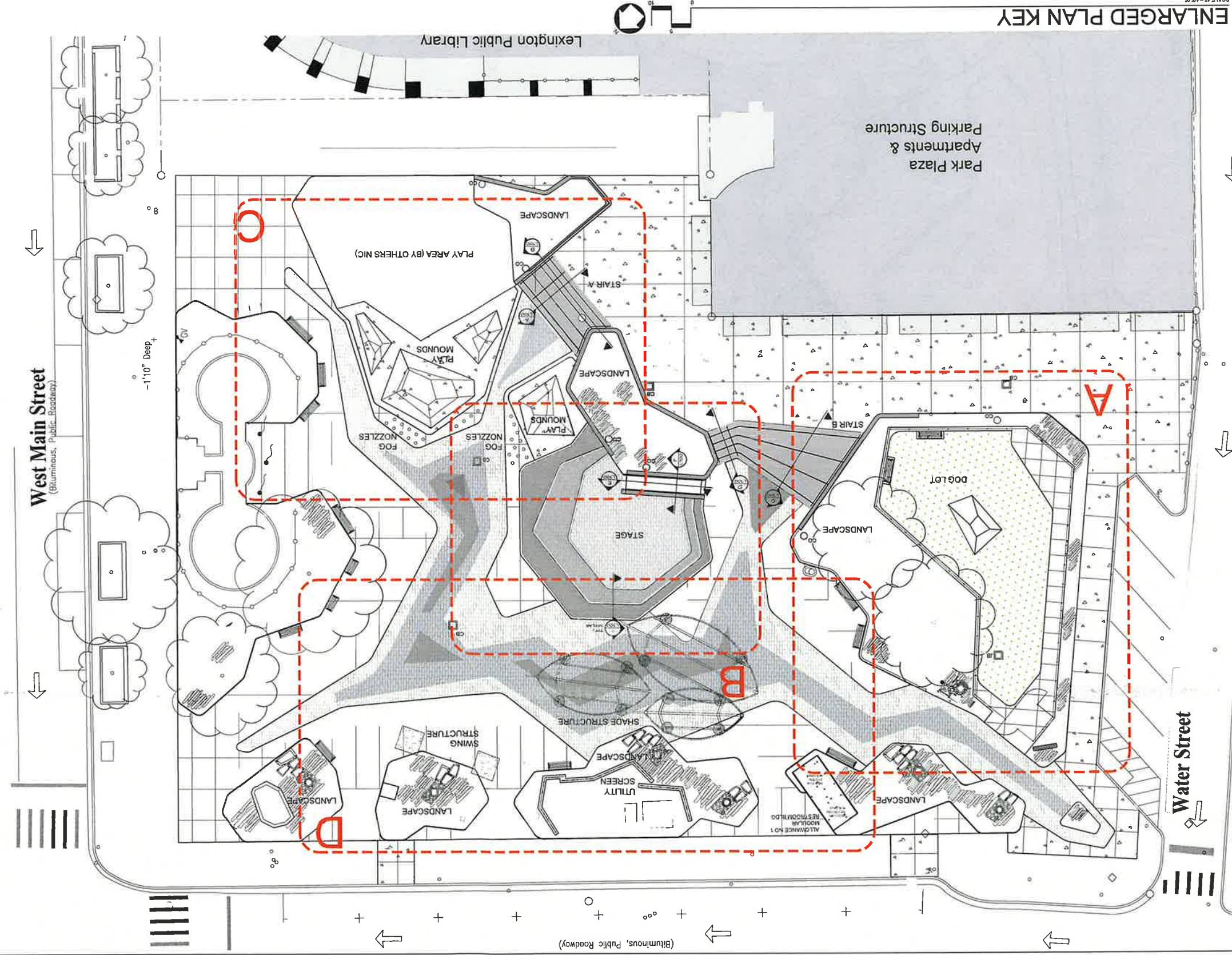
Design Change Log by sheet and revision number. Changes are indicated by a circled number in the revision number. Changes are indicated by a circled number in the revision number. Changes are indicated by a circled number in the revision number.



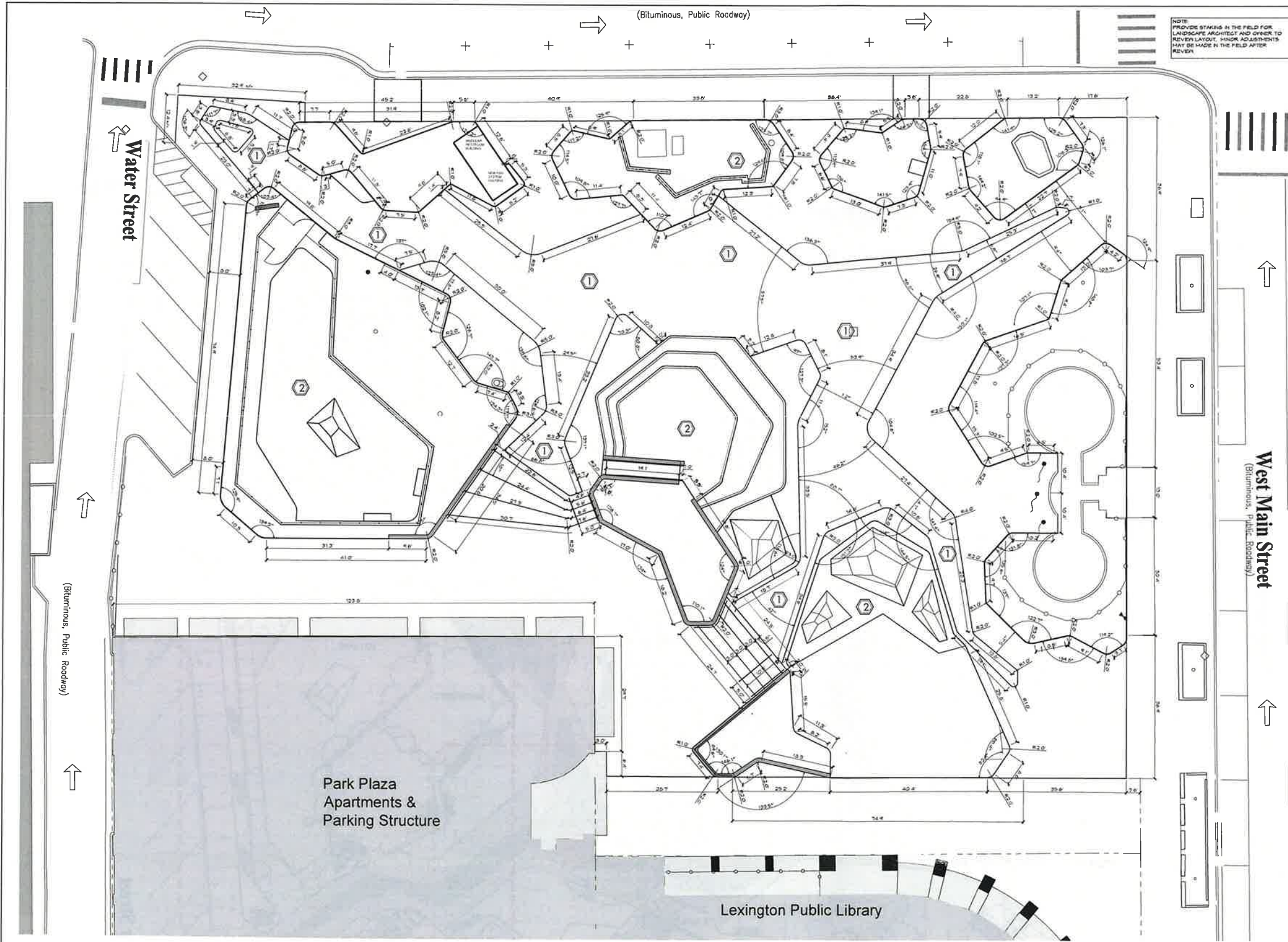
MATERIALS LEGEND:

	NEW HEAVY DUTY ASPHALT CONCRETE. SEE KEYNOTE 1 ON L402.
	NEW CONCRETE PAVEMENT ON CONCRETE. SEE KEYNOTE 2 ON L402.
	NEW CONCRETE PAVEMENT ON ASPHALT. SEE KEYNOTE 3 ON L402.
	NEW HEAVY DUTY ASPHALT CONCRETE. SEE KEYNOTE 1 ON L402.
	NEW CONCRETE PAVEMENT ON CONCRETE. SEE KEYNOTE 2 ON L402.
	NEW CONCRETE PAVEMENT ON ASPHALT. SEE KEYNOTE 3 ON L402.
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	NEW CONCRETE PAVEMENT ON ASPHALT. SEE KEYNOTE 3 ON L402.
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	NEW CONCRETE PAVEMENT ON CONCRETE. SEE KEYNOTE 2 ON L402.
	NEW CONCRETE PAVEMENT ON ASPHALT. SEE KEYNOTE 3 ON L402.

ENLARGED PLAN KEY
 SCALE 1" = 10'-0"



(Biluminous, Public Roadway)



NOTE:
 PROVIDE STAKES IN THE FIELD FOR LANDSCAPE ARCHITECT AND OWNER TO REVEAL LAYOUT. MINOR ADJUSTMENTS MAY BE MADE IN THE FIELD AFTER REVEAL.

- LAYOUT NOTES:**
- THE EXISTING TOPOGRAPHIC AND SITE INFORMATION SHOWN IS FROM A SURVEY PROVIDED BY ENRIS ENGINEERING. THIS INFORMATION IS PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION SHOWN THEREON. CONTRACTOR TO VERIFY ALL INFORMATION SHOWN. CONTRACTOR TO VERIFY ALL INFORMATION SHOWN.
 - DIMENSIONS GIVEN IN RELATIONSHIP TO BUILDINGS OR OTHER SITE ELEMENTS ARE MEASURED PERPENDICULAR FROM THE OUTSIDE FACE OF BRICK, STONE OR CONCRETE UNLESS OTHERWISE INDICATED. DIMENSIONS GIVEN AT ROADWAYS ARE FROM FACE OF CURB TO FACE OF CURB UNLESS OTHERWISE NOTED.
 - DIMENSIONS ARE REFERENCED AT 90 DEGREE ANGLES UNLESS OTHERWISE INDICATED. RADI ARE 5' UNLESS OTHERWISE INDICATED.
 - THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL INVOLVED UTILITY COMPANIES AND COORDINATING WITH THEM ALL CONSTRUCTION ACTIVITIES AND VERIFYING ALL SITE UTILITIES PRIOR TO CONSTRUCTION ACTIVITY.
 - PROVIDE EXPANSION JOINTS WHERE CONCRETE PAVEMENT ABUTS ALL WALL AND BUILDING FACES AS WELL AS WHERE CONCRETE PAVEMENT ABUTS OTHER NEW SLABS POURED SEPARATELY, TYPICAL.
 - REFER TO ENLARGED PLANS FOR ADDITIONAL LAYOUT AND DIMENSION INFORMATION.
 - ASSUME PAVEMENT RADI IS 2' UNLESS OTHERWISE NOTED.
 - REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

- LAYOUT LEGEND:**
- CENTERLINE
 - DIMENSION PLUS OR MINUS, VARIES DUE TO EXISTING CONDITIONS
 - SURVEY BENCHMARK, REFER TO SITE SURVEY
 - PI CENTERLINE POINT OF INTERSECTION
 - PC CENTERLINE POINT OF CURVATURE
 - PT CENTERLINE POINT OF TANGENCY
 - BC BUILDING CORNER

- LAYOUT KEY NOTES:**
- LAYOUT OF PAVERS IS APPROXIMATE, FLAG LOCATION FOR EDGES OF PAVERS / CONCRETE AND LOCATIONS OF TRANSITION BETWEEN PAVEMENT COLORS FOR REVEAL PRIOR TO BEGINNING PAVEMENT INSTALLATION WORK.
 - REFER TO ENLARGED PLAN FOR ADDITIONAL LAYOUT INFORMATION IN THIS AREA.

SITE LAYOUT PLAN
 SCALE 1" = 10'-0"



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**PHOENIX PARK REIMAGINED
 LFUGG PARKS AND RECREATION**
 100 East Main Street
 Lexington, KY

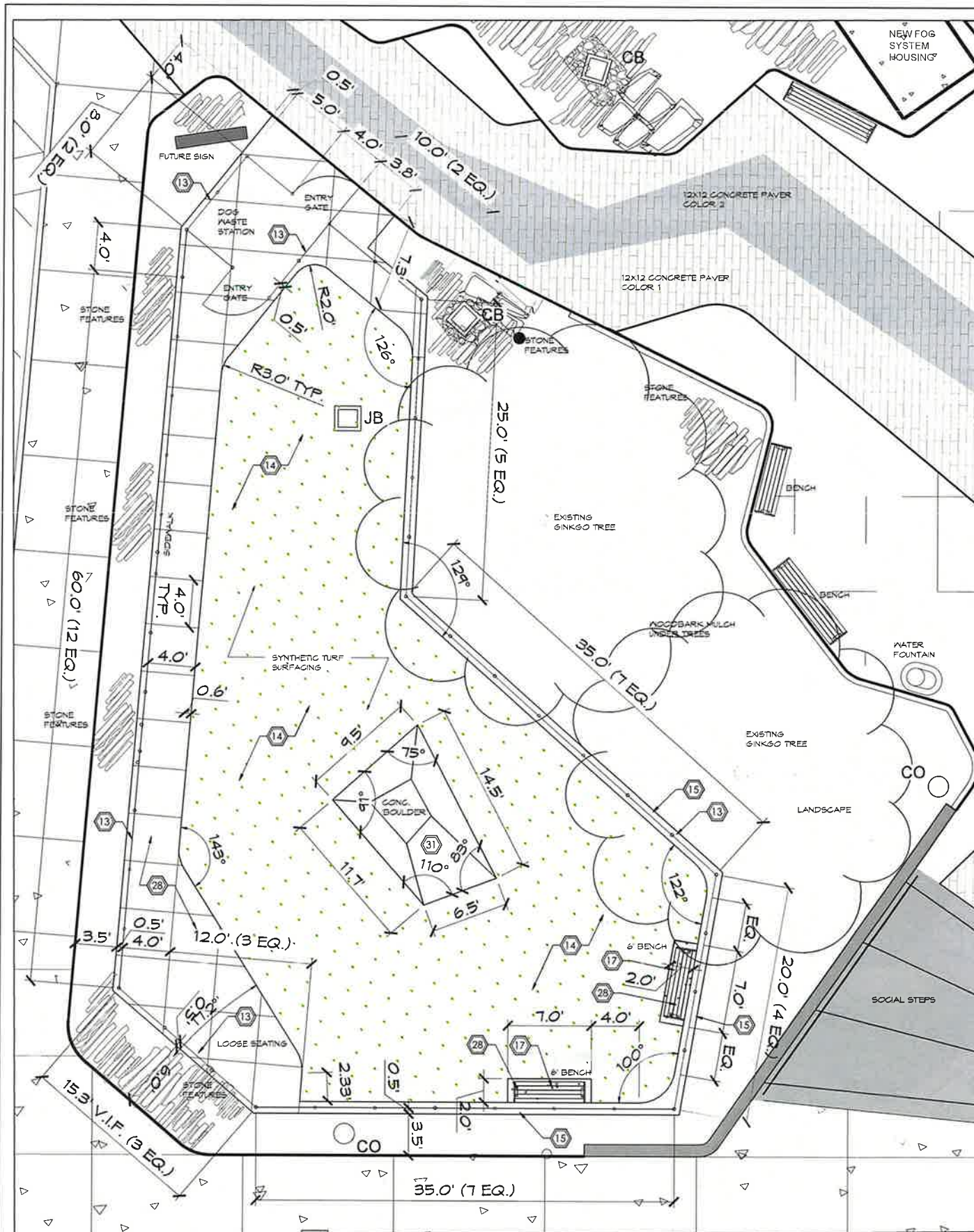
Site Layout Plan
 Sheet Title

Date: April 8, 2024
 Drawn by:
 Checked by:
 Revision:
 Revision:
 Revision:

CONSULTANTS:
 Gresham Smith
 Landscape Architecture Corporation
 KFI Engineers
 Site Element Engineer



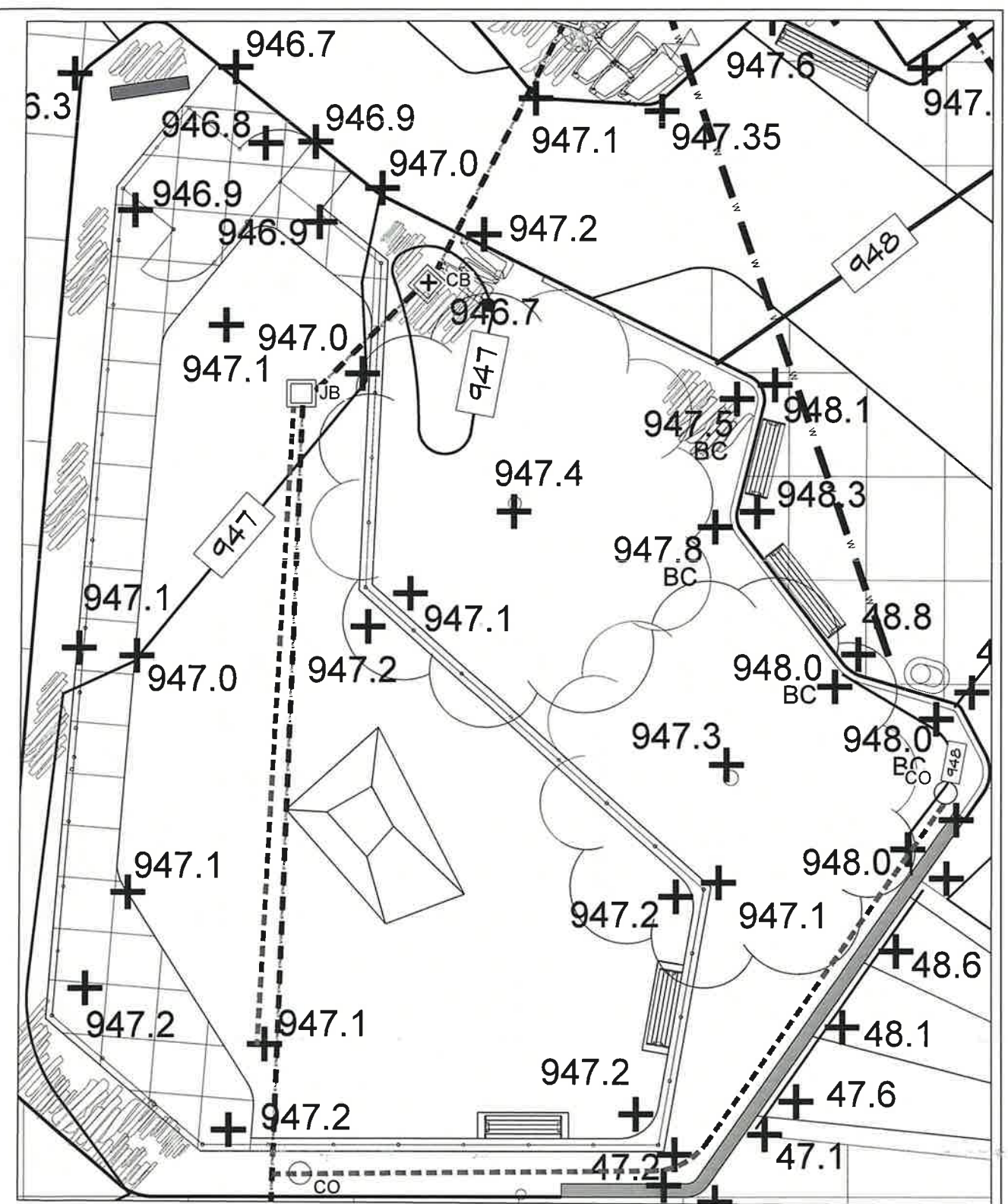
L401
 Drawing No.



ENLARGED PLAN A - DOG LOT LAYOUT & MATERIALS

SCALE 1/4" = 1'-0"

MATERIALS LEGEND:



ENLARGED PLAN A - DOG LOT GRADING & DRAINAGE

SCALE 1/4" = 1'-0"

SEE L402 FOR ADDITIONAL NOTES AND REQUIREMENTS (TYPICAL, ALL ENLARGED PLAN SHEETS)



Date: April 2024
 Drawn by:
 Checked by:
 Revision:
 Revision:
 Revision:

CONSULTANTS:
 Gresham Smith
 Landscape Architecture & Interiors
 KFI Engineers
 Site Electrical Engineer

PHOENIX PARK REIMAGINED
 LFUGG PARKS AND RECREATION

100 East Main Street
 Lexington, KY





Enlarged Plans A

Sheet Title

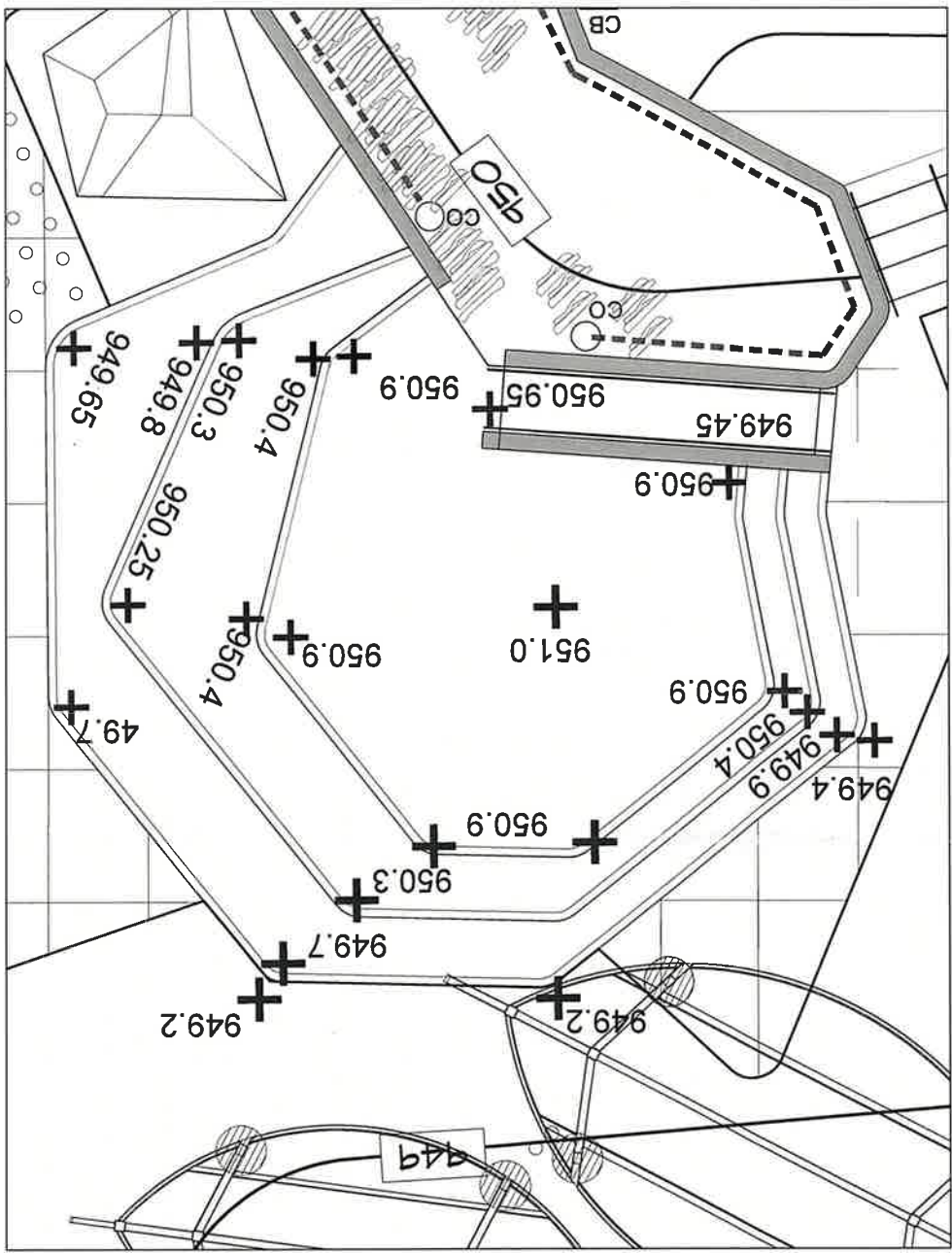
L403

Drawing No.

Drawing No. L404	 KRI Engineers CONSULTANTS: Gresham Smith	DATE: April 2024 DRAWN BY: CHECKED BY: REVISION: REVISION: REVISION: REVISION:
		
Sheet Title: Enlarged Plans B	100 East Main Street Lexington, KY PHOENIX PARK REIMAGINED LFCUG PARKS AND RECREATION	THIS DRAWING IS THE PROPERTY OF GRESHAM SMITH & ASSOCIATES, INC. (GSA). IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. NO PART OF THIS DRAWING IS TO BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT THE WRITTEN PERMISSION OF GSA. THE USER OF THIS DRAWING SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND REGULATIONS FROM THE APPROPRIATE AGENCIES. GSA SHALL NOT BE RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY ARISING FROM THE USE OF THIS DRAWING.

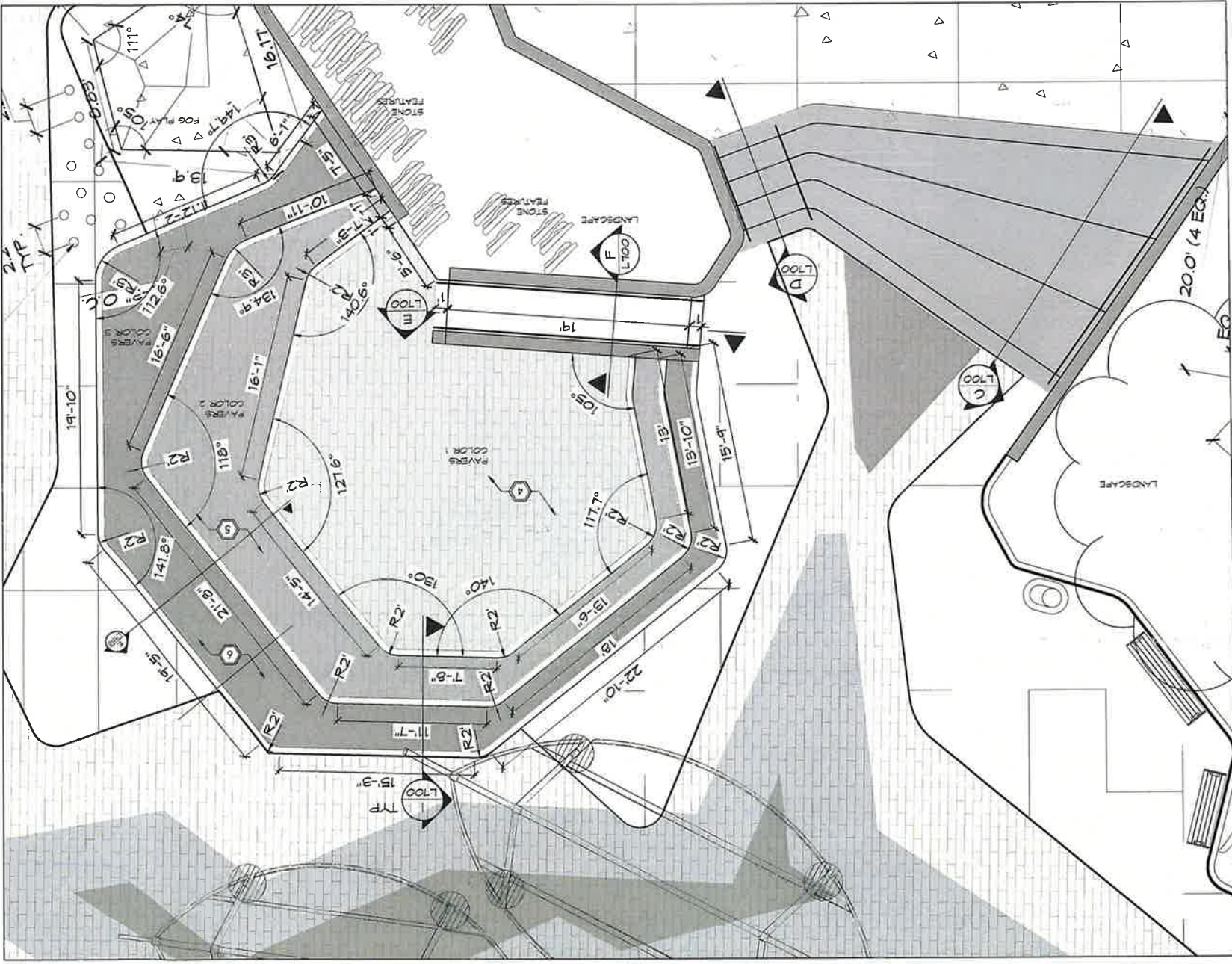
ENLARGED PLAN B - STAGE GRADING & DRAINAGE

SCALE 1/8" = 1'-0"



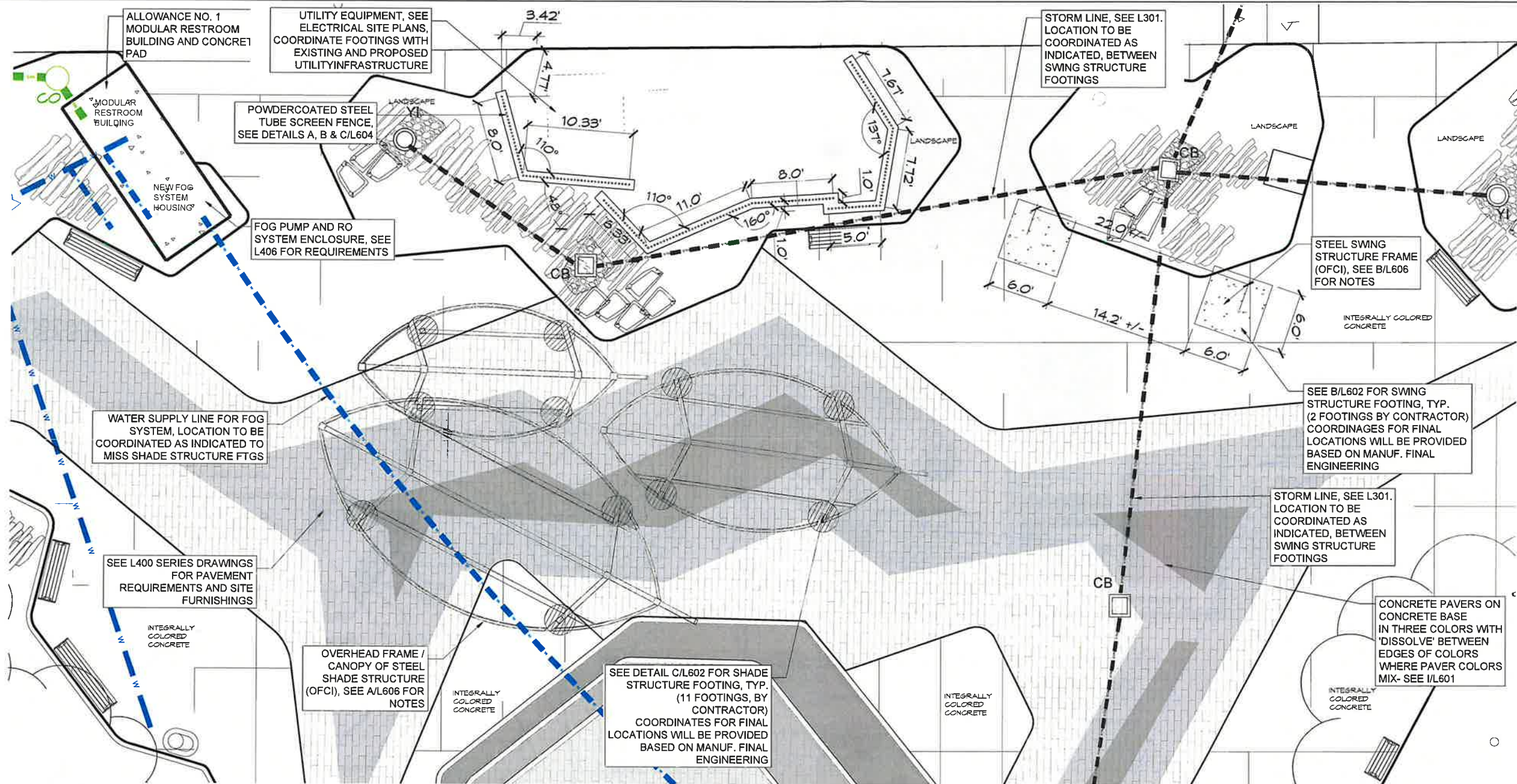
ENLARGED PLAN B - STAGE LAYOUT & MATERIALS

SCALE 1/8" = 1'-0"



MATERIALS LEGEND:

- NEW HAVERTY 1.5" THICKLY COMPACTED GRANULAR FILL (L700) SEE DETAIL L700
- NEW HAVERTY 2" THICK L702
- NEW HAVERTY 4" THICK L703
- NEW HAVERTY 8" THICK L704
- NEW HAVERTY 12" THICK L705
- NEW HAVERTY 18" THICK L706
- NEW HAVERTY 24" THICK L707
- NEW HAVERTY 30" THICK L708
- NEW HAVERTY 36" THICK L709
- NEW HAVERTY 42" THICK L710
- NEW HAVERTY 48" THICK L711
- NEW HAVERTY 54" THICK L712
- NEW HAVERTY 60" THICK L713
- NEW HAVERTY 66" THICK L714
- NEW HAVERTY 72" THICK L715
- NEW HAVERTY 78" THICK L716
- NEW HAVERTY 84" THICK L717
- NEW HAVERTY 90" THICK L718
- NEW HAVERTY 96" THICK L719
- NEW HAVERTY 102" THICK L720
- NEW HAVERTY 108" THICK L721
- NEW HAVERTY 114" THICK L722
- NEW HAVERTY 120" THICK L723
- NEW HAVERTY 126" THICK L724
- NEW HAVERTY 132" THICK L725
- NEW HAVERTY 138" THICK L726
- NEW HAVERTY 144" THICK L727
- NEW HAVERTY 150" THICK L728
- NEW HAVERTY 156" THICK L729
- NEW HAVERTY 162" THICK L730
- NEW HAVERTY 168" THICK L731
- NEW HAVERTY 174" THICK L732
- NEW HAVERTY 180" THICK L733
- NEW HAVERTY 186" THICK L734
- NEW HAVERTY 192" THICK L735
- NEW HAVERTY 198" THICK L736
- NEW HAVERTY 204" THICK L737
- NEW HAVERTY 210" THICK L738
- NEW HAVERTY 216" THICK L739
- NEW HAVERTY 222" THICK L740
- NEW HAVERTY 228" THICK L741
- NEW HAVERTY 234" THICK L742
- NEW HAVERTY 240" THICK L743
- NEW HAVERTY 246" THICK L744
- NEW HAVERTY 252" THICK L745
- NEW HAVERTY 258" THICK L746
- NEW HAVERTY 264" THICK L747
- NEW HAVERTY 270" THICK L748
- NEW HAVERTY 276" THICK L749
- NEW HAVERTY 282" THICK L750
- NEW HAVERTY 288" THICK L751
- NEW HAVERTY 294" THICK L752
- NEW HAVERTY 300" THICK L753
- NEW HAVERTY 306" THICK L754
- NEW HAVERTY 312" THICK L755
- NEW HAVERTY 318" THICK L756
- NEW HAVERTY 324" THICK L757
- NEW HAVERTY 330" THICK L758
- NEW HAVERTY 336" THICK L759
- NEW HAVERTY 342" THICK L760
- NEW HAVERTY 348" THICK L761
- NEW HAVERTY 354" THICK L762
- NEW HAVERTY 360" THICK L763
- NEW HAVERTY 366" THICK L764
- NEW HAVERTY 372" THICK L765
- NEW HAVERTY 378" THICK L766
- NEW HAVERTY 384" THICK L767
- NEW HAVERTY 390" THICK L768
- NEW HAVERTY 396" THICK L769
- NEW HAVERTY 402" THICK L770
- NEW HAVERTY 408" THICK L771
- NEW HAVERTY 414" THICK L772
- NEW HAVERTY 420" THICK L773
- NEW HAVERTY 426" THICK L774
- NEW HAVERTY 432" THICK L775
- NEW HAVERTY 438" THICK L776
- NEW HAVERTY 444" THICK L777
- NEW HAVERTY 450" THICK L778
- NEW HAVERTY 456" THICK L779
- NEW HAVERTY 462" THICK L780
- NEW HAVERTY 468" THICK L781
- NEW HAVERTY 474" THICK L782
- NEW HAVERTY 480" THICK L783
- NEW HAVERTY 486" THICK L784
- NEW HAVERTY 492" THICK L785
- NEW HAVERTY 498" THICK L786
- NEW HAVERTY 504" THICK L787
- NEW HAVERTY 510" THICK L788
- NEW HAVERTY 516" THICK L789
- NEW HAVERTY 522" THICK L790
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- NEW HAVERTY 534" THICK L792
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- NEW HAVERTY 546" THICK L794
- NEW HAVERTY 552" THICK L795
- NEW HAVERTY 558" THICK L796
- NEW HAVERTY 564" THICK L797
- NEW HAVERTY 570" THICK L798
- NEW HAVERTY 576" THICK L799
- NEW HAVERTY 582" THICK L800
- NEW HAVERTY 588" THICK L801
- NEW HAVERTY 594" THICK L802
- NEW HAVERTY 600" THICK L803
- NEW HAVERTY 606" THICK L804
- NEW HAVERTY 612" THICK L805
- NEW HAVERTY 618" THICK L806
- NEW HAVERTY 624" THICK L807
- NEW HAVERTY 630" THICK L808
- NEW HAVERTY 636" THICK L809
- NEW HAVERTY 642" THICK L810
- NEW HAVERTY 648" THICK L811
- NEW HAVERTY 654" THICK L812
- NEW HAVERTY 660" THICK L813
- NEW HAVERTY 666" THICK L814
- NEW HAVERTY 672" THICK L815
- NEW HAVERTY 678" THICK L816
- NEW HAVERTY 684" THICK L817
- NEW HAVERTY 690" THICK L818
- NEW HAVERTY 696" THICK L819
- NEW HAVERTY 702" THICK L820
- NEW HAVERTY 708" THICK L821
- NEW HAVERTY 714" THICK L822
- NEW HAVERTY 720" THICK L823
- NEW HAVERTY 726" THICK L824
- NEW HAVERTY 732" THICK L825
- NEW HAVERTY 738" THICK L826
- NEW HAVERTY 744" THICK L827
- NEW HAVERTY 750" THICK L828
- NEW HAVERTY 756" THICK L829
- NEW HAVERTY 762" THICK L830
- NEW HAVERTY 768" THICK L831
- NEW HAVERTY 774" THICK L832
- NEW HAVERTY 780" THICK L833
- NEW HAVERTY 786" THICK L834
- NEW HAVERTY 792" THICK L835
- NEW HAVERTY 798" THICK L836
- NEW HAVERTY 804" THICK L837
- NEW HAVERTY 810" THICK L838
- NEW HAVERTY 816" THICK L839
- NEW HAVERTY 822" THICK L840
- NEW HAVERTY 828" THICK L841
- NEW HAVERTY 834" THICK L842
- NEW HAVERTY 840" THICK L843
- NEW HAVERTY 846" THICK L844
- NEW HAVERTY 852" THICK L845
- NEW HAVERTY 858" THICK L846
- NEW HAVERTY 864" THICK L847
- NEW HAVERTY 870" THICK L848
- NEW HAVERTY 876" THICK L849
- NEW HAVERTY 882" THICK L850
- NEW HAVERTY 888" THICK L851
- NEW HAVERTY 894" THICK L852
- NEW HAVERTY 900" THICK L853
- NEW HAVERTY 906" THICK L854
- NEW HAVERTY 912" THICK L855
- NEW HAVERTY 918" THICK L856
- NEW HAVERTY 924" THICK L857
- NEW HAVERTY 930" THICK L858
- NEW HAVERTY 936" THICK L859
- NEW HAVERTY 942" THICK L860
- NEW HAVERTY 948" THICK L861
- NEW HAVERTY 954" THICK L862
- NEW HAVERTY 960" THICK L863
- NEW HAVERTY 966" THICK L864
- NEW HAVERTY 972" THICK L865
- NEW HAVERTY 978" THICK L866
- NEW HAVERTY 984" THICK L867
- NEW HAVERTY 990" THICK L868
- NEW HAVERTY 996" THICK L869
- NEW HAVERTY 1002" THICK L870
- NEW HAVERTY 1008" THICK L871
- NEW HAVERTY 1014" THICK L872
- NEW HAVERTY 1020" THICK L873
- NEW HAVERTY 1026" THICK L874
- NEW HAVERTY 1032" THICK L875
- NEW HAVERTY 1038" THICK L876
- NEW HAVERTY 1044" THICK L877
- NEW HAVERTY 1050" THICK L878
- NEW HAVERTY 1056" THICK L879
- NEW HAVERTY 1062" THICK L880
- NEW HAVERTY 1068" THICK L881
- NEW HAVERTY 1074" THICK L882
- NEW HAVERTY 1080" THICK L883
- NEW HAVERTY 1086" THICK L884
- NEW HAVERTY 1092" THICK L885
- NEW HAVERTY 1098" THICK L886
- NEW HAVERTY 1104" THICK L887
- NEW HAVERTY 1110" THICK L888
- NEW HAVERTY 1116" THICK L889
- NEW HAVERTY 1122" THICK L890
- NEW HAVERTY 1128" THICK L891
- NEW HAVERTY 1134" THICK L892
- NEW HAVERTY 1140" THICK L893
- NEW HAVERTY 1146" THICK L894
- NEW HAVERTY 1152" THICK L895
- NEW HAVERTY 1158" THICK L896
- NEW HAVERTY 1164" THICK L897
- NEW HAVERTY 1170" THICK L898
- NEW HAVERTY 1176" THICK L899
- NEW HAVERTY 1182" THICK L900
- NEW HAVERTY 1188" THICK L901
- NEW HAVERTY 1194" THICK L902



ENLARGED PLAN D- SHADE STRUCTURE, SWING STRUCTURE, UTILITY AREA SCREEN

SCALE 1/4" = 1'-0"

MATERIALS LEGEND:

	NEW HEAVY DUTY INTEGRALLY COLORED CONCRETE TO MATCH TOWN BRANCH COMMONS PAVEMENT. SEE KEYNOTE 2 ON L402		NEW NATIVE LIMESTONE / FLASSTONE PIECES AT DRAINAGE PATHS TO ALLEYS IN LANDSCAPE AREAS. SEE KEYNOTE 25 ON L402
	NEW HEAVY DUTY CP CONCRETE. SEE KEYNOTE 1 ON L402		NEW WATER FOUNTAIN WITH BOTTLE FILLER AND 2000 BOWL. FOUNTAIN TO BE ORDER PURCHASED / CONTRACTOR INSTALLED (OPC) SEE KEYNOTE 24 ON L402
	NEW CONCRETE PAVERS ON CONCRETE BASE. SEE KEYNOTES 4, 5 & 6		NEW LITTER RECEPTACLE (DUD) ONE RECYCLING AND ONE REGULAR TRASH CONTAINER ON CONCRETE PAD WHERE TWO ARE INDICATED; SINGLE LITTER ONLY RECEPTACLE WHERE ONE IS INDICATED. SEE KEYNOTE 16 ON L402
	CONTROL JOINT- SEE DETAIL D/L401		NEW TABLE AND CHAIR SET. SEE KEYNOTE 21 ON L402
	EXPANSION JOINT- SEE DETAIL E/L401		NEW BENCH. SEE KEYNOTE 17 ON L402
	NEW NATURAL STACKED STONE FEATURE IN LANDSCAPE AREA. SEE KEYNOTE 26 ON L402		



**PHOENIX PARK REIMAGINED
LFUGG PARKS AND RECREATION**

100 East Main Street
Lexington, KY

Enlarged
Plan D

Sheet Title

Date: April 8, 2024
 Drawn by:
 Checked by:
 Revision:
 Revision:
 Revision:

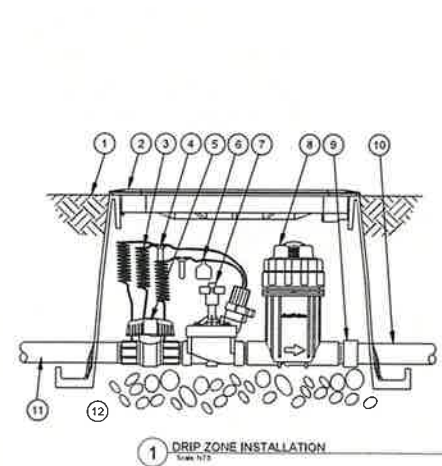
CONSULTANTS:
 Gresham Smith
 Landscape Architecture & Consulting

KFI Engineers
 Site Electrical Engineer

L407

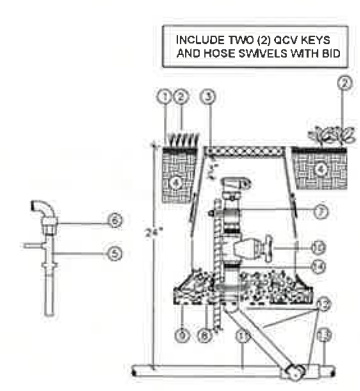
Drawing No.





- 1 FINISH GRADE/TOP OF MULCH
- 2 VALVE BOX WITH COVER: RAIN BIRD VB-STD
- 3 30-INCH LINEAR LENGTH OF WIRE, COILED
- 4 WATERPROOF CONNECTION:
- 5 1-INCH BALL VALVE
- 6 ID TAG
- 7 REMOTE CONTROL VALVE: (CZ-101-40 KIT)
- 8 PRESSURE REGULATING QUICK CHECK BASKET FILTER:
- 9 PVC SCH 40 FEMALE ADAPTOR
- 10 LATERAL PIPE
- 11 MAINLINE PIPE
- 12 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL

1 DRIP ZONE INSTALLATION
Scale: NTS SECTION



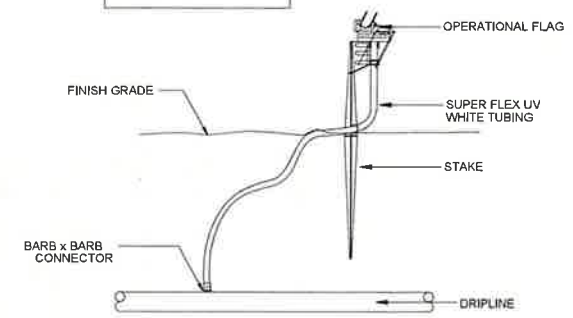
INCLUDE TWO (2) QCV KEYS AND HOSE SWIVELS WITH BID

USE A NON-HARDENING TEFLON PIPE SEALANT ON ALL THREADED CONNECTIONS.

2 QUICK COUPLER VALVE 5/8 IN 10\"/>

- 1 FINISH GRADE
- 2 PLANT MATERIAL (TURF, SHRUB OR GROUND COVER)
- 3 VALVE BOX, 10\"/>
- 4 CLEAN SOIL SEE SPECS
- 5 QUICK COUPLER KEY, Q.C. HOSE SWIVEL
- 6 QUICK COUPLER VALVE
- 7 3\"/>
- 8 BRICK SUPPORTS 1 OF 2
- 9 1\"/>
- 10 TEE OR ELBOW, PVC SCH 40, SIZE PER PLAN.
- 11 REBAR STAKE WITH STAINLESS STEEL GEAR CLAMPS OR EQUIVALENT SUPPORT SYSTEM

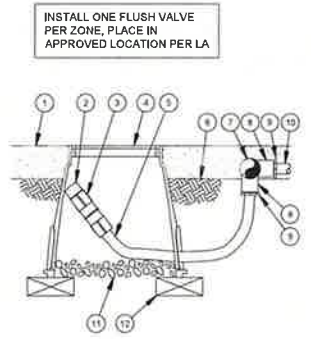
INSTALL ONE INDICATOR PER ZONE, PLACE IN APPROVED LOCATION PER LA



LOCATE INDICATOR STAKE AT THE FARTHEST AND/OR HIGHEST POINT ON THE ZONE.

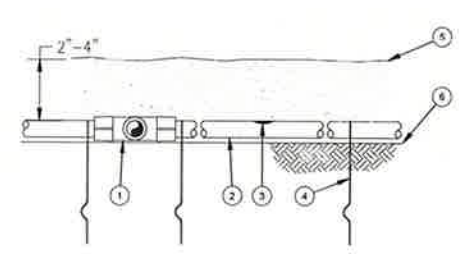
3 OPERATIONAL INDICATOR
Scale: NTS SECTION

NOTE: 1. ALLOW A MINIMUM OF 6-INCHES OF DRIFLINE TUBING IN VALVE BOX IN ORDER TO DIRECT FLUSHED WATER OUTSIDE VALVE BOX.



4 FLUSH VALVE AT THE END OF EVERY DRIP ZONE
Scale: NTS SECTION

- 1 MULCH
- 2 FLUSH CAP FOR EASY FIT COMPRESSION FITTINGS:
- 3 EASY FIT COUPLING:
- 4 SUBTERRANEAN EMITTER BOX:
- 5 1/2\"/>
- 6 FINISH GRADE
- 7 PVC EXHAUST HEADER
- 8 PVC SCH 40 TEE OR EL
- 9 BARB X MALE FITTING
- 10 ON-SURFACE DRIFLINE: TLCV SERIES DRIFLINE
- 11 3-INCH MINIMUM DEPTH OF 3/4\"/>
- 12 BRICK (1 OF 2)

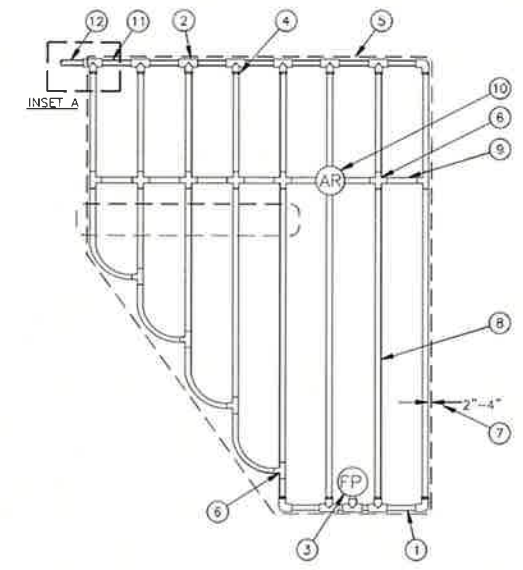


- 1 EASY FIT COMPRESSION TEE: RAIN BIRD MDCFTTEE
- 2 ON-SURFACE DRIFLINE: RAIN BIRD XF SERIES DRIFLINE POTABLE XFD DRIFLINE NON-POTABLE XFDP DRIFLINE
- 3 INLINE DRIP EMITTER OUTLET
- 4 TIE DOWN STAKE RAIN BIRD TDS-050 WITH BEND (TYPICAL)
- 5 MULCH
- 6 FINISH GRADE

NOTES:
1. PLACE TIE DOWN STAKES EVERY THREE FEET IN SAND, FOUR FEET IN LOAM, AND FIVE FEET IN CLAY.
2. AT FITTINGS WHERE THERE IS A CHANGE OF DIRECTION SUCH AS TEES OR ELBOWS, USE TIE-DOWN STAKES ON EACH LEG OF THE CHANGE OF DIRECTION.

5 DRIFLINE ON SURFACE BELOW MULCH
Scale: NTS SECTION

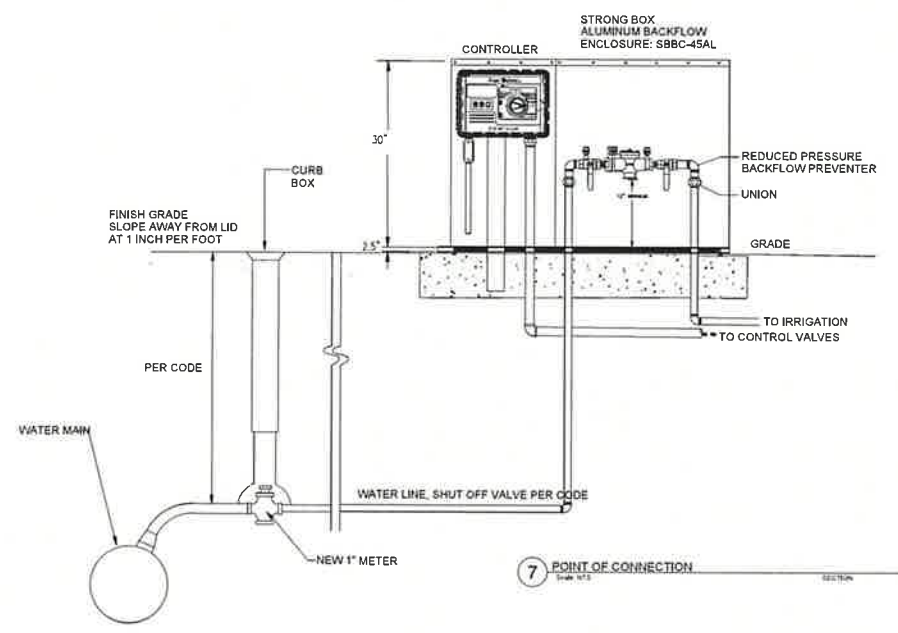
Inlet Pressure psi	XFS Dripline Maximum Lateral Lengths (Feet)					
	12\"/>					
	15	255	194	357	273	448
20	291	220	408	313	514	394
30	350	266	494	378	622	478
40	396	302	560	428	705	541
50	434	333	614	470	775	594



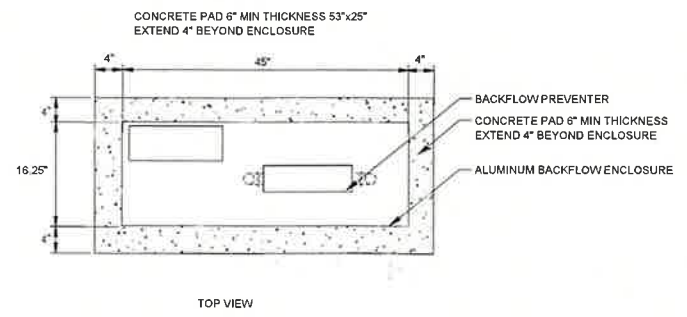
- 1 PVC EXHAUST HEADER
- 2 PVC SCH 40 TEE OR EL (TYPICAL)
- 3 FLUSH POINT (TYPICAL) SEE RAIN BIRD DETAIL \"XFS FLUSH POINT\" OR \"XFS FLUSH POINT WITH BALL VALVE\"
- 4 BARB X MALE FITTING: RAIN BIRD XFD-MA FITTING (TYPICAL)
- 5 PERIMETER OF AREA
- 6 BARB X BARB INSERT TEE OR CROSS: RAIN BIRD XFD-TEE OR RAIN BIRD XFD-CROSS (TYPICAL)
- 7 PERIMETER DRIFLINE PIPE TO BE INSTALLED 2-4\"/>
- 8 SUB-SURFACE DRIFLINE: RAIN BIRD XF SERIES DRIFLINE (TYPICAL) POTABLE XFS DRIFLINE NON-POTABLE XFSP DRIFLINE
- 9 1/2\"/>
- 10 AIR RELIEF VALVE: RAIN BIRD AR VALVE KIT SEE RAIN BIRD DETAIL \"XFS AIR RELIEF VALVE KIT\"
- 11 PVC SUPPLY MANIFOLD
- 12 PVC SUPPLY PIPE FROM RAIN BIRD CONTROL ZONE KIT (SIZED TO MEET LATERAL FLOW DEMAND)
- 13 TOTAL LENGTH OF SELECTED DRIFLINE SHOULD NOT EXCEED LENGTH SHOWN IN TABLE
- 14 PVC SCH 40 RISER PIPE

NOTES:
1. DISTANCE BETWEEN LATERAL ROWS AND EMITTER SPACING TO BE BASED ON SOIL TYPE, PLANT MATERIALS AND CHANGES IN ELEVATION. SEE RAIN BIRD XFS DRIFLINE INSTALLATION GUIDE FOR SUGGESTED SPACINGS.
2. LENGTH OF LONGEST DRIFLINE LATERAL SHOULD NOT EXCEED THE MAXIMUM LENGTH SHOWN IN THE ACCOMPANYING TABLE.
3. AIR RELIEF VALVE TO BE INSTALLED AT HIGH POINT OF AREA.

6 DRIFLINE SUB SURFACE INSTALLATION
Scale: NTS SECTION

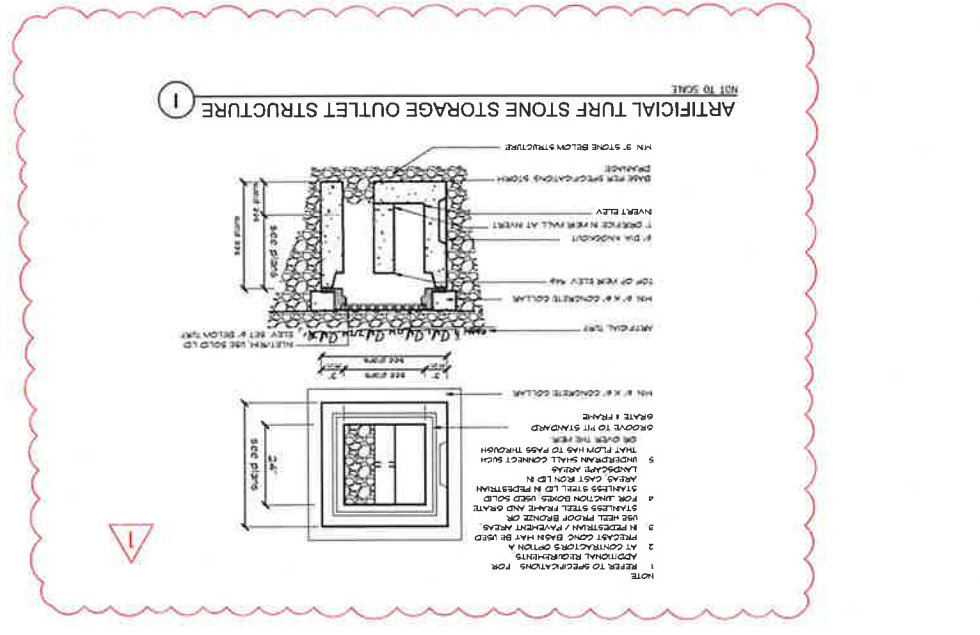
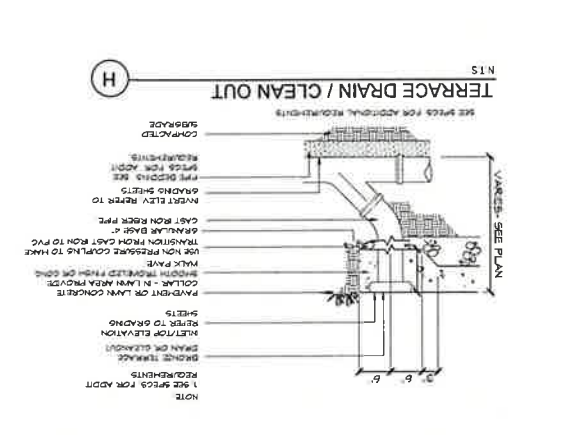
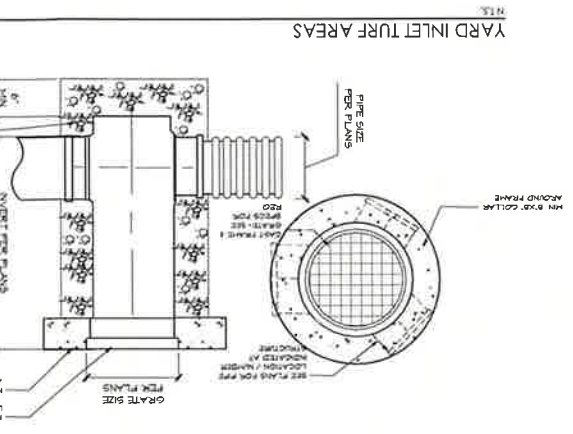
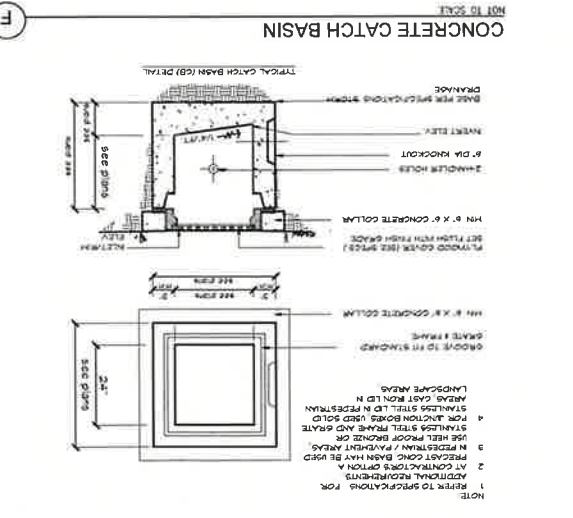
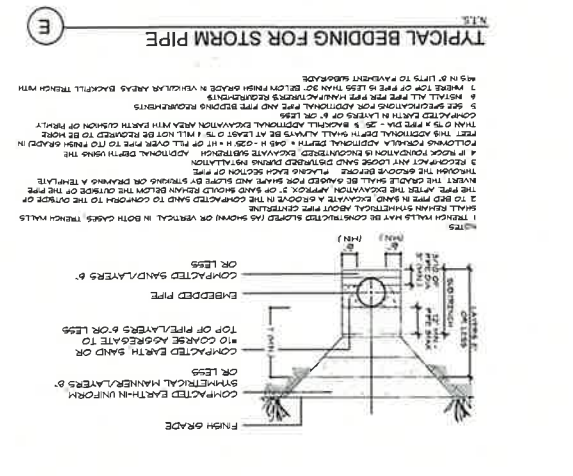
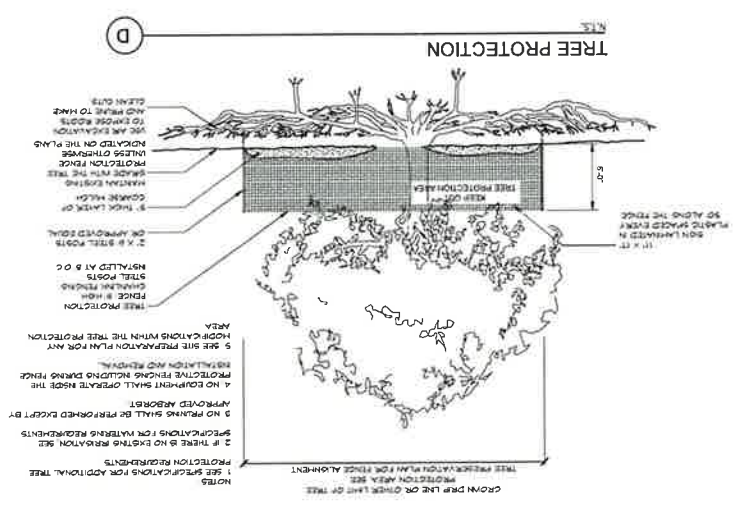
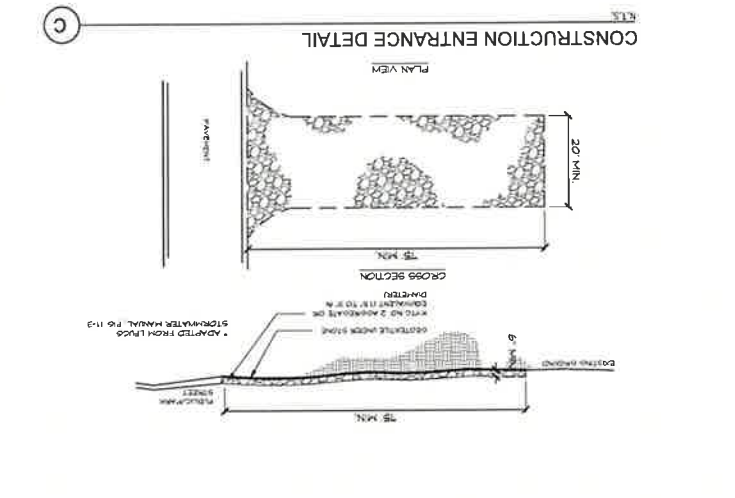
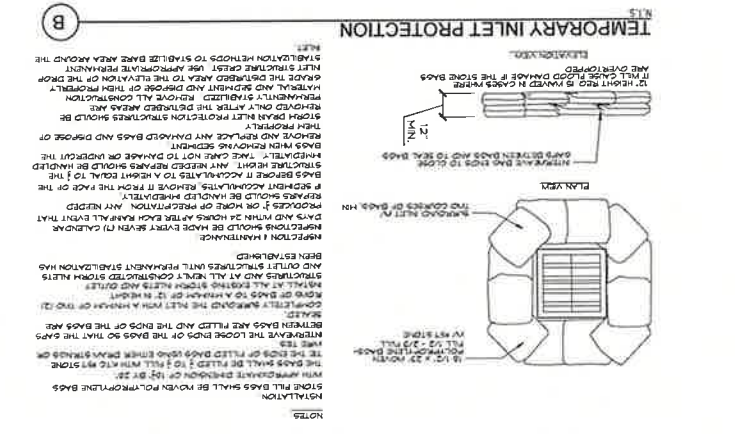
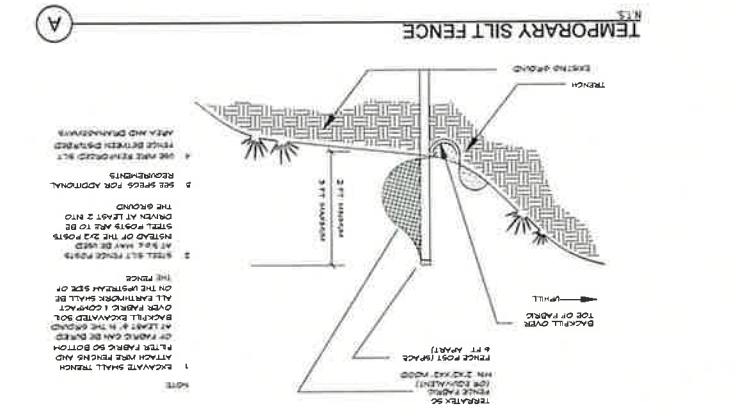


7 POINT OF CONNECTION
Scale: NTS SECTION

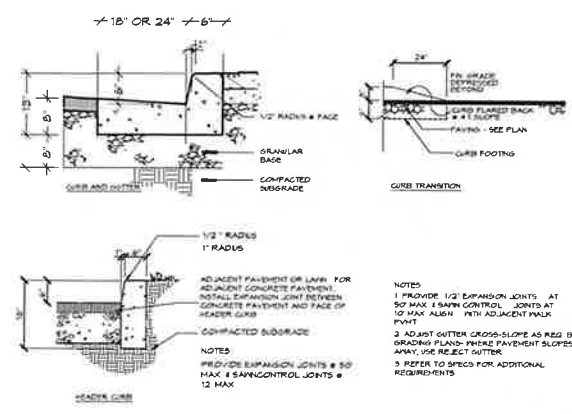


TOP VIEW

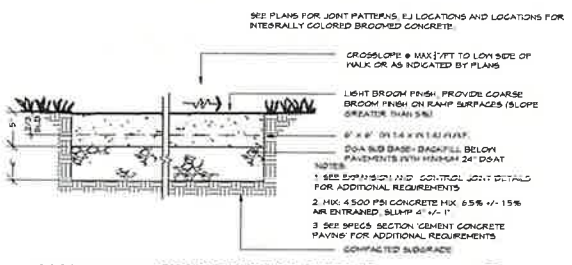
PHOENIX PARK REIMAGINED LFUCG PARKS AND RECREATION 100 East Main Street Lexington, KY		Site Irrigation Details Sheet T-10
Date: April 6, 2024 Drawn by: DLB Checked by: RF Revision: Revision: Revision:	CONSULTANTS: Gresham Smith <small>Landscape Architecture Collaborative</small> KFI Engineers <small>Site Electrical Engineer</small>	 L503 <small>Drawing File</small>



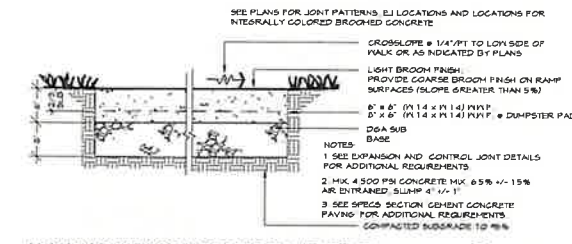
Drawing No. L600		KFI Engineers CONSULTANTS: Gresham Smith LEANER ARCHITECTS CONSULTANTS	DATE: APRIL 2024 DRAWN BY: JAY L. BROWN CHECKED BY: JAY L. BROWN REVISION:
			SHEET TITLE: Storm Details
PROJECT: PHOENIX PARK REIMAGINED	ADDRESS: 100 East Main Street Lexington, KY	SCALE: AS SHOWN	NOTES: 1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. 2. PRECAST CONCRETE BASIN SHALL BE USED AT CONNECTIONS. 3. PRECAST CONCRETE BASIN SHALL BE USED AT CONNECTIONS. 4. PRECAST CONCRETE BASIN SHALL BE USED AT CONNECTIONS. 5. PRECAST CONCRETE BASIN SHALL BE USED AT CONNECTIONS. 6. PRECAST CONCRETE BASIN SHALL BE USED AT CONNECTIONS.



CIP CONCRETE CURB
N.T.S. (A)



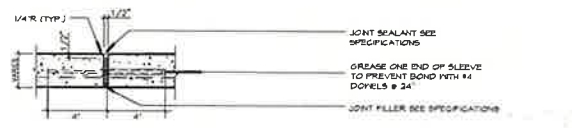
LIGHT DUTY CONCRETE PAVEMENT
N.T.S. (B)



HEAVY DUTY CONCRETE PAVEMENT
N.T.S. (C)



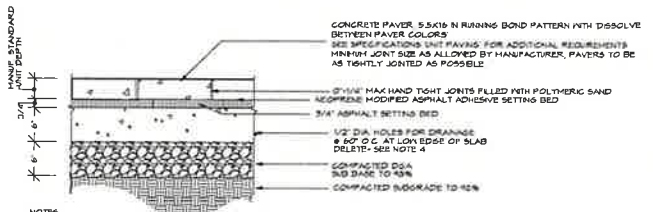
TOOLED CONTROL JOINT
N.T.S. (D)



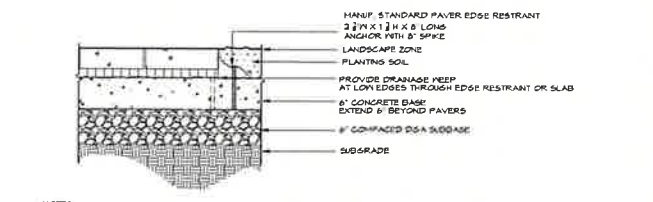
EXPANSION JOINT AT CONC. PAVEMENT
N.T.S. (E)



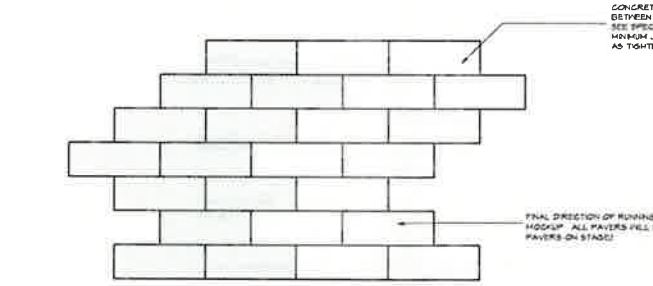
DETAIL NOT USED
N.T.S. (F)



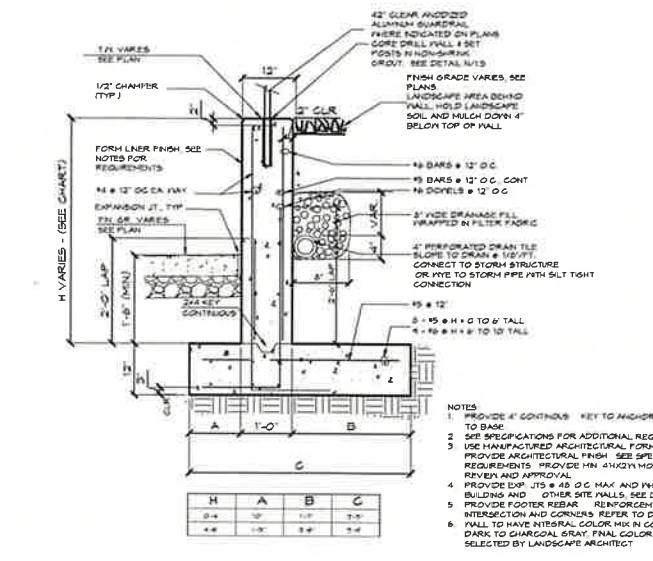
CONCRETE PAVERS IN BIT. SETTING BED ON CONCRETE BASE
N.T.S. (G)



PAVER EDGE RESTRAINT WHERE NOT ADJACENT TO CONCRETE
N.T.S. (H)



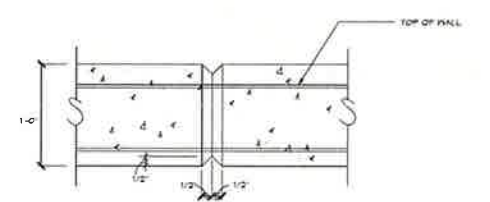
PAVER DISSOLVE DETAIL
N.T.S. (I)



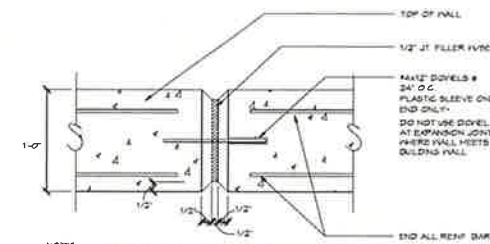
CONCRETE RETAINING WALL SIZING CHART

CIP CONCRETE SITE RETAINING WALLS
N.T.S. (J)

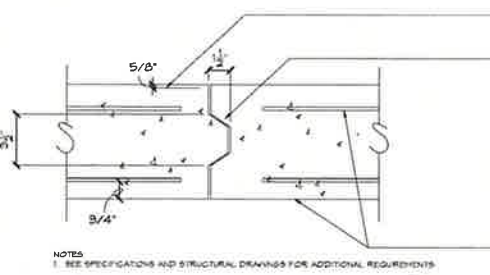
DETAIL NOT USED
N.T.S. (K)



CONC. WALL CONTROL JOINT
N.T.S. (L)



CONC. WALL EXPANSION JOINT
N.T.S. (M)



CONC. WALL CONSTRUCTION JOINT
N.T.S. (N)



PHOENIX PARK REIMAGINED
LFUGC PARKS AND RECREATION
100 East Main Street
Lexington, KY

Site Details
Sheet Title

Date: April 2024
Drawn by:
Checked by:
Revision:
Revision:
Revision:

CONSULTANTS:
Gresham Smith
Landscape Architecture Collaborator
KFI Engineers
Site Structural Engineer

element design
landscape architecture + civil engineering
L601
Drawing No.

CONSULTANTS:
Gesham Smith
KFI Engineers

element design

100 East Main Street
Lexington, KY

**PHOENIX PARK REIMAGINED
LFUCG PARKS AND RECREATION**

Site Details
Sheet Title

Drawing No. **1602**

DATE: April 8, 2024
Checked By: Gesham Smith
Checked By: KFI Engineers

TRASH + RECYCLING RECEPTACLE INSTALLATION - OFCI

EXCLUSIVE BY DESIGN

KEystone DESIGN

NOTE: TRASH RECEPTACLES ARE DIRECTLY PURCHASED AND INSTALLED BY OWNER AND CONTRACTOR. TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED IN LAOD SERIES DRAWINGS. TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

TRASH RECEPTACLE INSTALLATION - OFCI

EXCLUSIVE BY DESIGN

KEystone DESIGN

NOTE: TRASH RECEPTACLES ARE DIRECTLY PURCHASED AND INSTALLED BY OWNER AND CONTRACTOR. TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED IN LAOD SERIES DRAWINGS. TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

TABLE INSTALLATION - OFCI

EXCLUSIVE BY DESIGN

KEystone DESIGN

NOTE: TABLE TO BE DIRECTLY PURCHASED AND INSTALLED BY OWNER AND CONTRACTOR. TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

TABLE AND CHAIRS ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

BENCH INSTALLATION - OFCI

EXCLUSIVE BY DESIGN

KEystone DESIGN

NOTE: THE BENCHES ARE DIRECTLY PURCHASED AND INSTALLED BY OWNER AND CONTRACTOR. BENCHES ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

THE BENCHES ARE DIRECTLY PURCHASED AND INSTALLED BY OWNER AND CONTRACTOR. BENCHES ARE KEystone RIDE PBN SINGLE RECEPTACLE. DOUBLE WITH RECYCLING RECEPTACLE WERE INDICATED THEREIN.

STEEL SHADE STRUCTURE SCHEMATIC FOOTING DETAIL

NOTES:

- STONE SHALL BE NATIVE PENNSYLVANIA Limestone, BUT Limestone FROM OTHER STATES INCLUDING MARYLAND, VIRGINIA, AND WEST VIRGINIA ARE ACCEPTABLE. STONE SHALL BE SET IN MORTAR.
- ALL STONED BRICK STONE FEATURES SHALL HAVE THE SAME DIMENSIONS AND SETTING AS THE STONED BRICK STONE FEATURES. STONE SHALL HAVE THE SAME GENERAL APPEARANCE AS THE STONED BRICK STONE FEATURES.
- STONED BRICK STONE SHALL HAVE THE SAME DIMENSIONS AND SETTING AS THE STONED BRICK STONE FEATURES. STONE SHALL HAVE THE SAME GENERAL APPEARANCE AS THE STONED BRICK STONE FEATURES.

POWDERCOATED STEEL GUARDRAIL WITH MESH INFILL PANEL

SCALE: 1/2" = 1'-0"

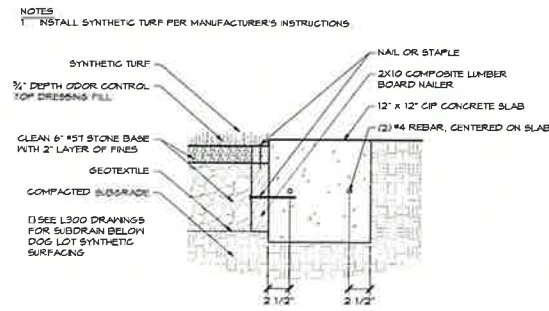
NOTES:

- SEE SPECIFICATIONS FOR APPLICABLE REQUIREMENTS FOR GUARDRAIL AND MESH INFILL PANELS.
- ALL GUARDRAIL AND MESH INFILL PANELS SHALL BE MANUFACTURED BY THE SAME MANUFACTURER.
- ALL GUARDRAIL AND MESH INFILL PANELS SHALL BE MANUFACTURED BY THE SAME MANUFACTURER.

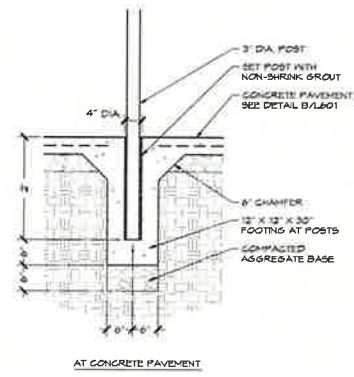
DRY STONE CHANNEL AT STORM INLETS

NOTES:

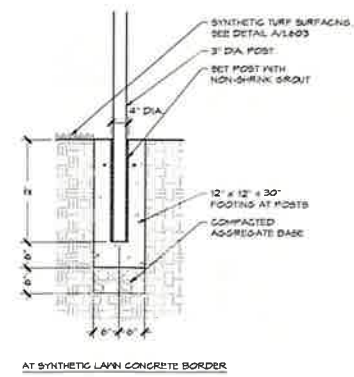
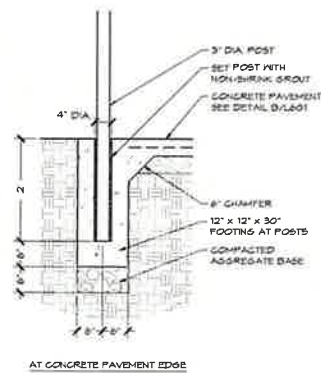
- SEE SPECIFICATIONS FOR APPLICABLE REQUIREMENTS FOR DRY STONE CHANNELS.
- ALL DRY STONE CHANNELS SHALL BE MANUFACTURED BY THE SAME MANUFACTURER.
- ALL DRY STONE CHANNELS SHALL BE MANUFACTURED BY THE SAME MANUFACTURER.



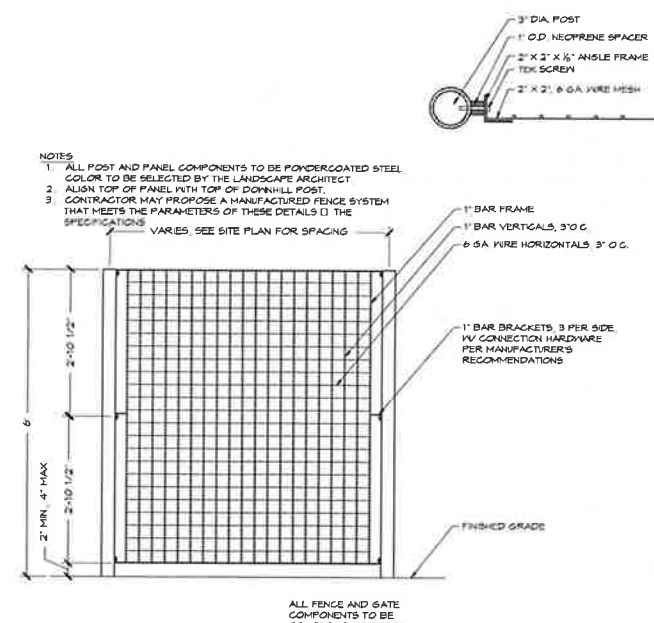
SYNTHETIC TURF SURFACING
1/2" x 1'-0"



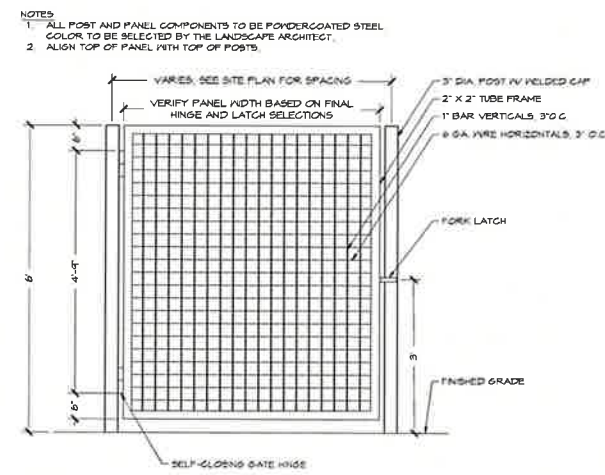
A FENCE POST CONNECTIONS
1/2" x 1'-0"



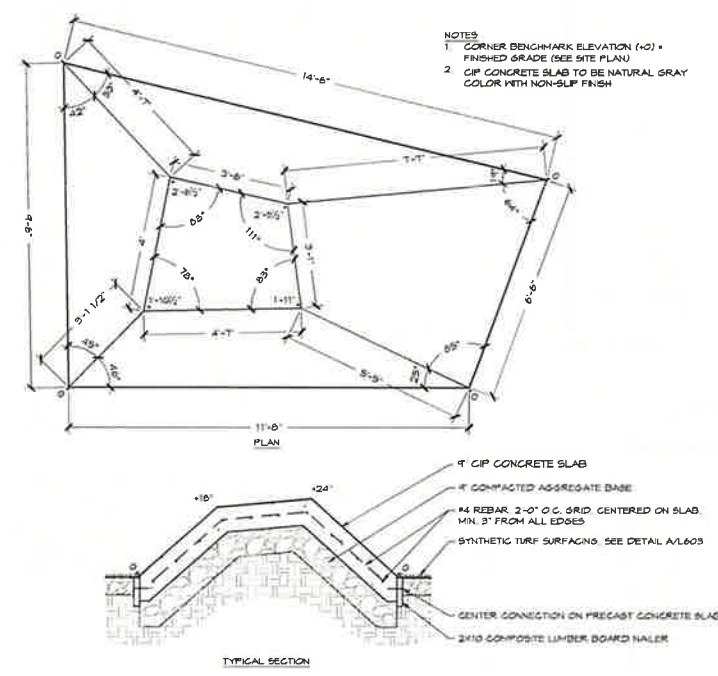
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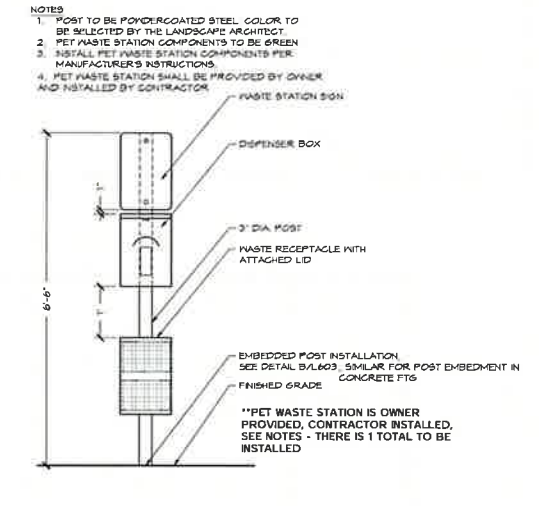
DOG LOT FENCE
1/2" x 1'-0"



C DOG LOT GATE
1/2" x 1'-0"



D CLIMBING ROCK
1/2" x 1'-0"



E PET WASTE STATION
1/2" x 1'-0"



Date: April 8, 2023
 Drawn by: TB
 Checked by: RF
 Revision: _____
 Revision: _____
 Revision: _____

**PHOENIX PARK REIMAGINED
 LFUCG PARKS AND RECREATION**
 100 East Main Street
 Lexington, KY

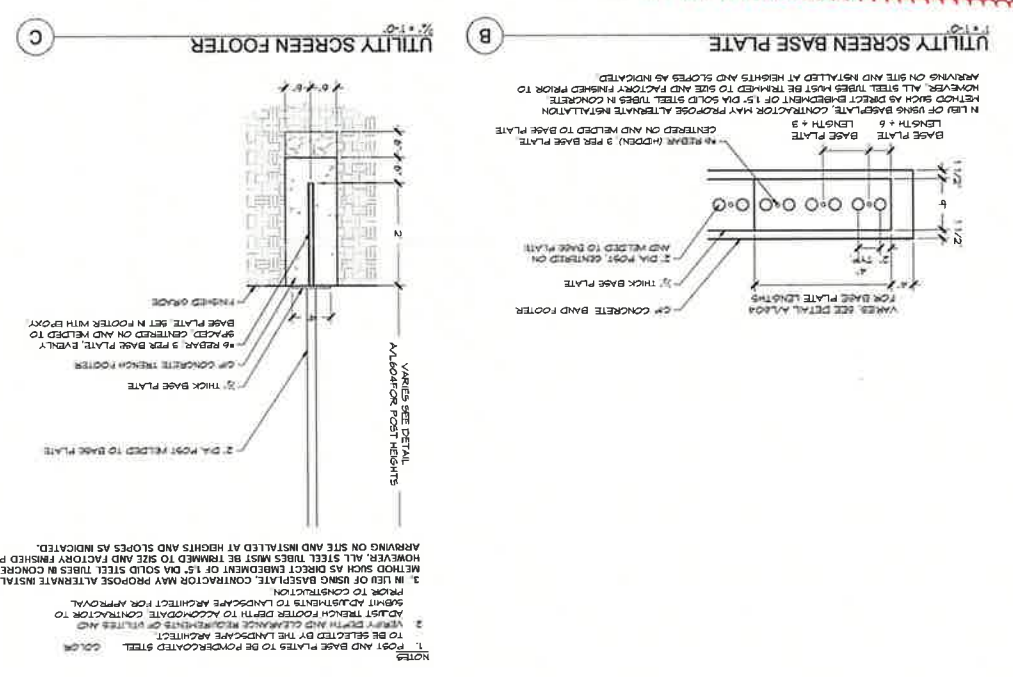
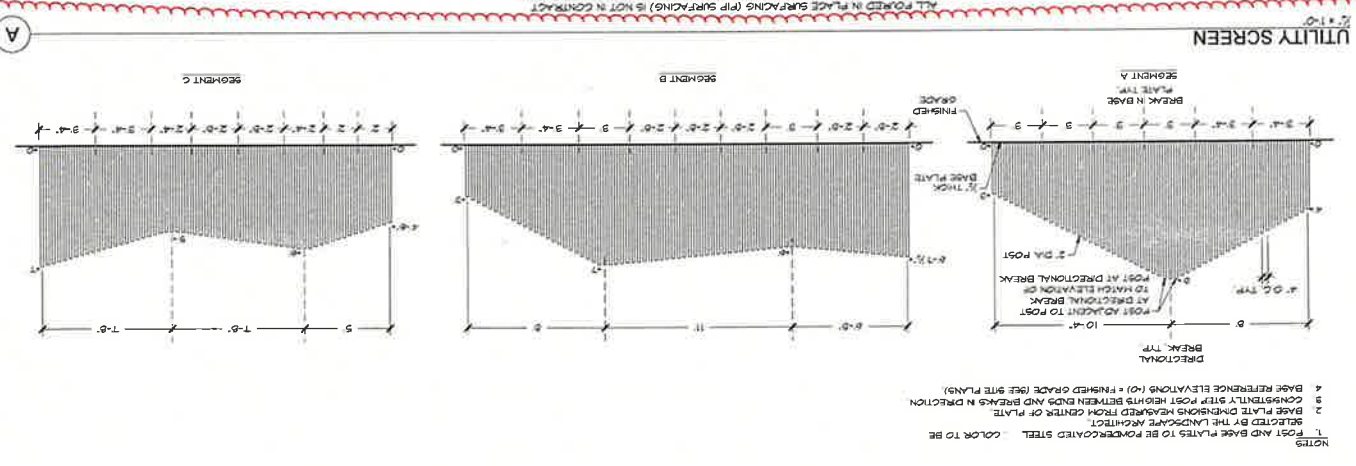
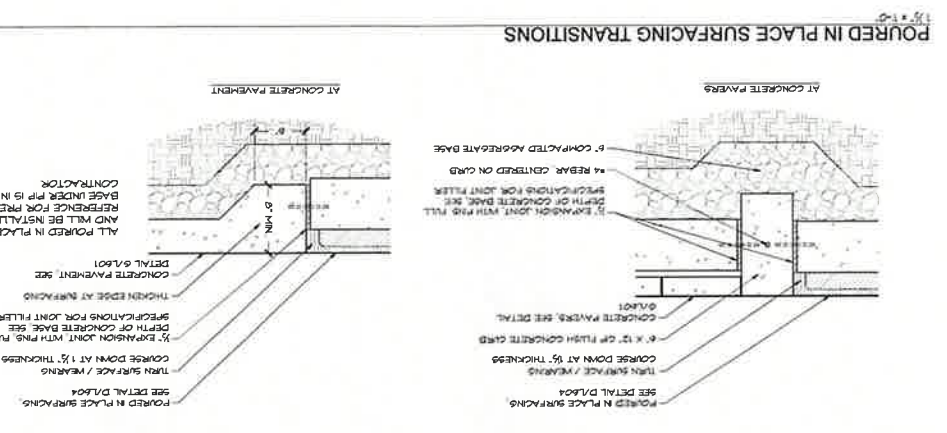
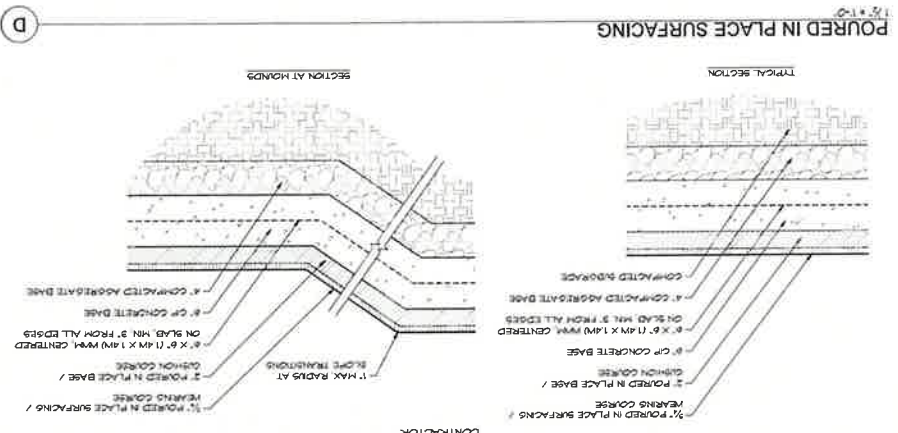
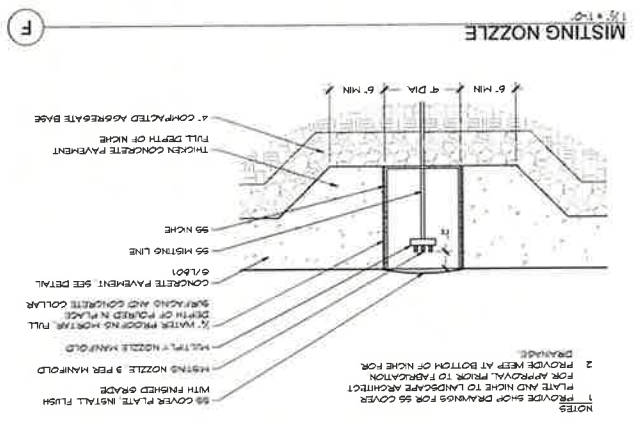
CONSULTANTS:
 Gresham Smith
 Landscape Architecture Collaborative
 KFI Engineers
 Site District Engineer



Site Details
 Drawing No. **L603**

CONSULTANTS: Gresham Smith Landscape Architecture KFI Engineers Architecture & Engineering element design	Date: April 8, 2018 Drawn by: TB Checked by: RF Revision: ADDENDUM 1
	Date: April 8, 2018 Drawn by: TB Checked by: RF Revision: ADDENDUM 1

100 East Main Street Lexington, KY	PHOENIX PARK REIMAGINED LFUGG PARKS AND RECREATION Site Details
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Leaf Series

Incorporate natural surroundings into an innovative shade solution using Polygon Leaf structures. This new design captures nature's creativity with a shape that mirrors the natural delicate curvature of a leaf and a roof that mimics symmetric veins and blade edges.

Polygon Leaf structures use a concept known as biomimicry. This approach to innovation seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies. Everything in nature has been optimized by survival and proven itself to be the optimal design. Tapping into nature's superb qualities opens up a rich new world of inspiration for shade structures.

Polygon Leaf structures fit perfectly in a natural environment and can also bring a slice of natural design into urban life. Utilizing designs inspired by the natural world makes the possibilities infinite!

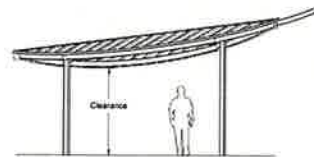
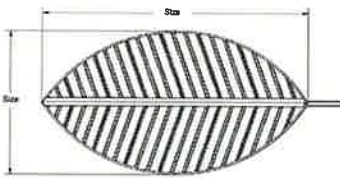


innovative shade solutions inspired by nature



BIN	Suggested Size	Minimum Clearance Height	Square Feet
LEAF	8' x 14'	7'-6"	80
LEAF	12' x 23'	7'-6"	190
LEAF	16' x 30'	7'-6"	350
LEAF	20' x 38'	7'-6"	530

*Additional sizes available in 1' increments



poligon
open air shade structures

4240 North 136th Avenue • Holland, MI 49424
T- 616 399 1963 • F- 616 399 9123 • E- info@poligon.com
www.poligon.com

- STEEL SHADE STRUCTURE NOTES**
- LEAF SHADE STRUCTURES AND FINAL SHADE STRUCTURE ENGINEERING ARE OWNER PURCHASE / OWNER PROVIDED. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SCHEDULE AND DELIVERY WITH STRUCTURE MANUFACTURER AND OWNER, FOR INSTALLATION OF FOOTINGS, AND FOR INSTALLATION AND ASSEMBLY OF STRUCTURE ONCE DELIVERED.
 - SEE DETAIL CALLOUT FOR NOTES AND REQUIREMENTS RE: PRELIMINARY FOOTING DESIGN FOR BIDDING PURPOSES. FINAL ENGINEERING BY SHADE STRUCTURE MANUFACTURER.



THREE LEAF STRUCTURE WITH PERFORATED ROOF, SIMILAR TO PROPOSED SHADE STRUCTURE FOR PHOENIX PARK

SHADE STRUCTURE CUT-SHEET

SCALE: N.T.S.

(A)



IMAGE OF SIMILAR STRUCTURE IN FACTORY



IMAGE OF SIMILAR STRUCTURE IN FACTORY



IMAGE OF SIMILAR STRUCTURE IN FACTORY

landscapeforms

- SWING STRUCTURE NOTES:**
- SWING STRUCTURES AND FINAL SHADE STRUCTURE ENGINEERING ARE OWNER PURCHASE / OWNER PROVIDED. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SCHEDULE AND DELIVERY WITH STRUCTURE MANUFACTURER AND OWNER, FOR INSTALLATION OF FOOTINGS, AND FOR INSTALLATION AND ASSEMBLY OF STRUCTURE ONCE DELIVERED.
 - SEE DETAIL CALLOUT FOR NOTES AND REQUIREMENTS RE: PRELIMINARY FOOTING DESIGN FOR BIDDING PURPOSES. FINAL ENGINEERING BY SWING STRUCTURE MANUFACTURER.

SWING STRUCTURES - REFERENCE IMAGES

SCALE: N.T.S.



IMAGE OF SIMILAR STRUCTURE ON SITE DURING ASSEMBLY



IMAGE OF SIMILAR STRUCTURE INSTALLED WITH SWINGS

SWING STRUCTURES ARE OWNER PURCHASE / OWNER PROVIDED AND CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SCHEDULE AND DELIVERY WITH STRUCTURE MANUFACTURER AND OWNER, FOR INSTALLATION OF FOOTINGS, AND FOR INSTALLATION AND ASSEMBLY OF STRUCTURE ONCE DELIVERED.

INCLUDED HEREIN ARE PHOTOS OF A SIMILAR STRUCTURE UNDER FABRICATION AND AFTER INSTALLED, AS WELL AS THE MANUFACTURER'S CONTACT INFORMATION.

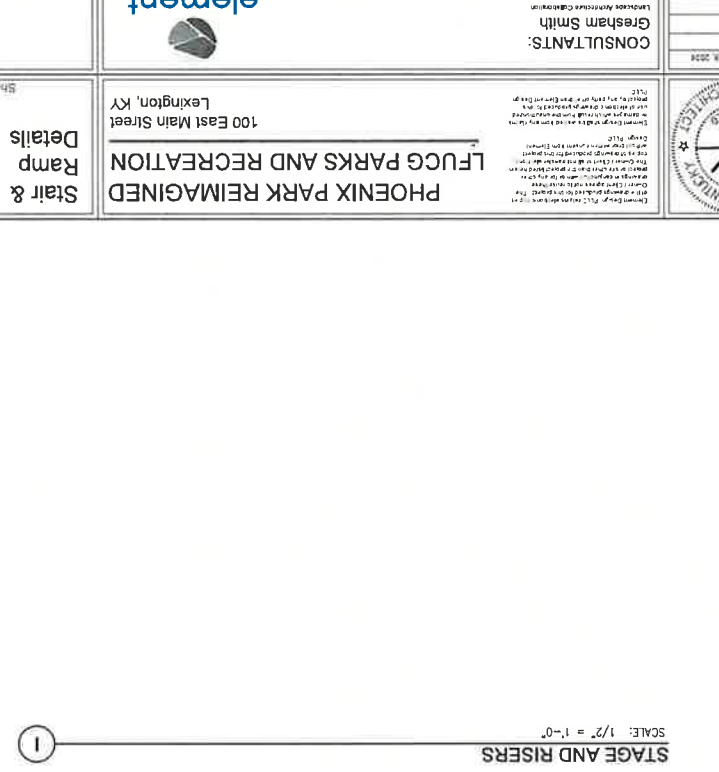
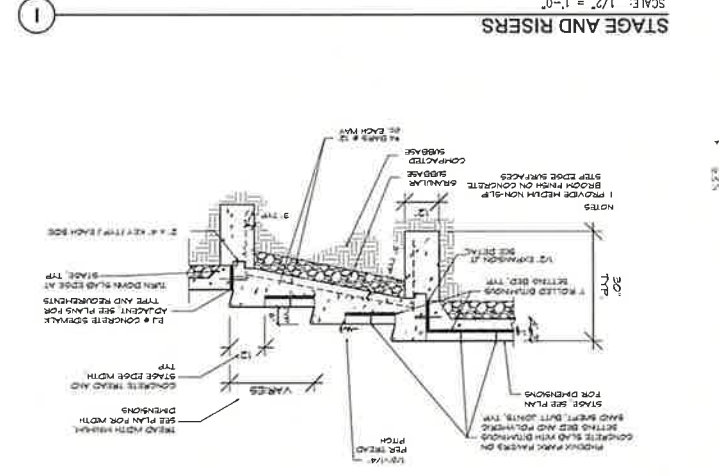
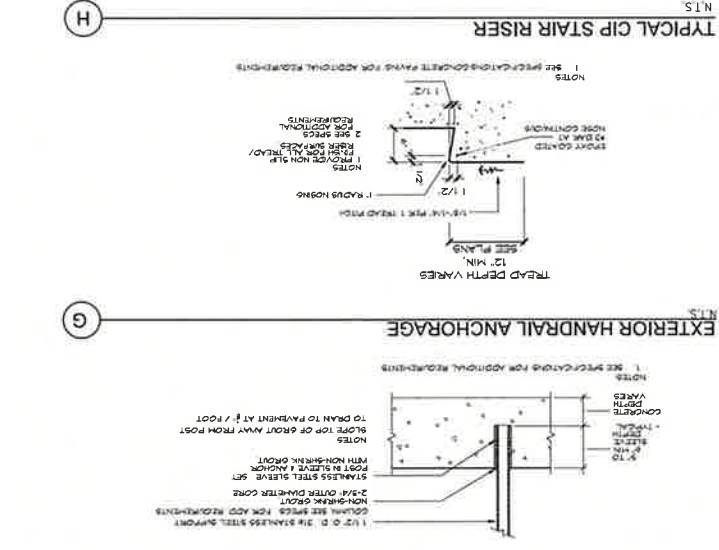
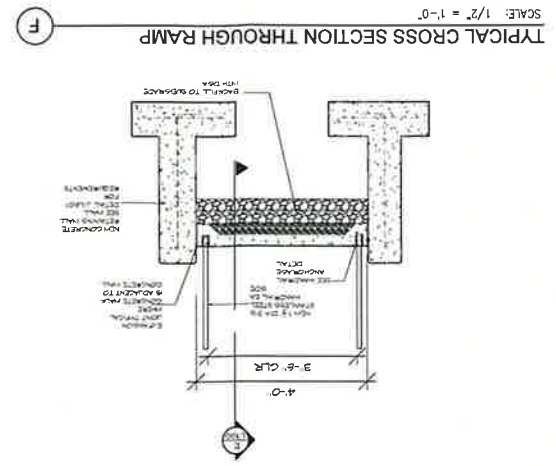
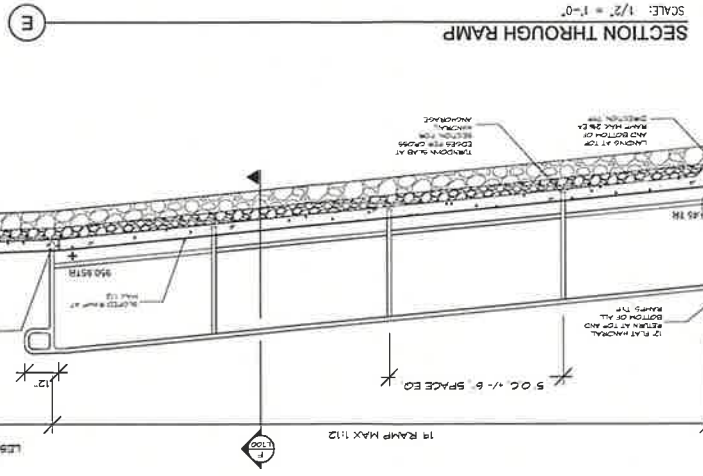
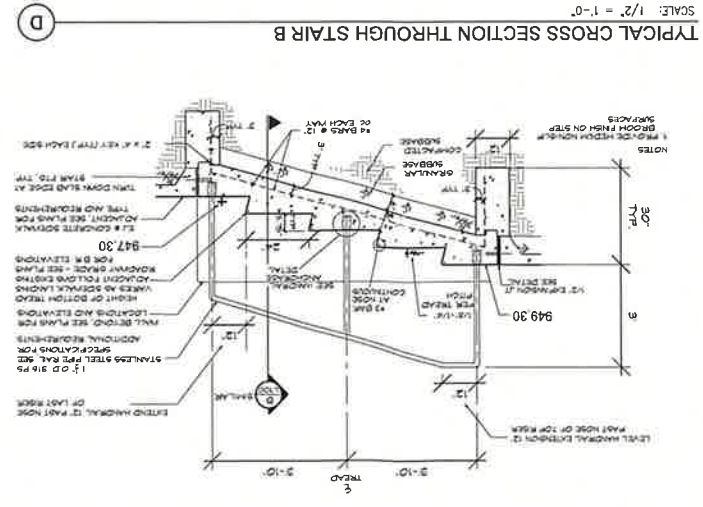
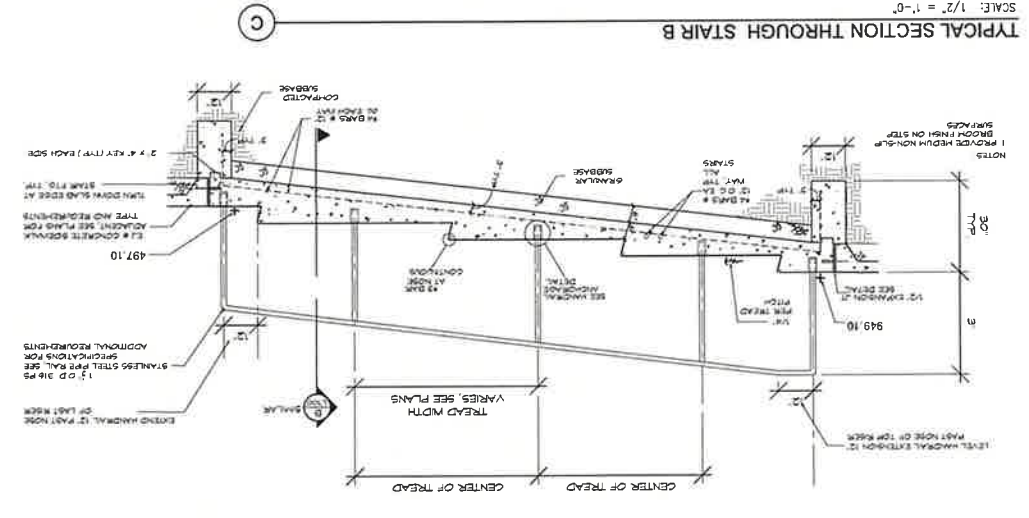
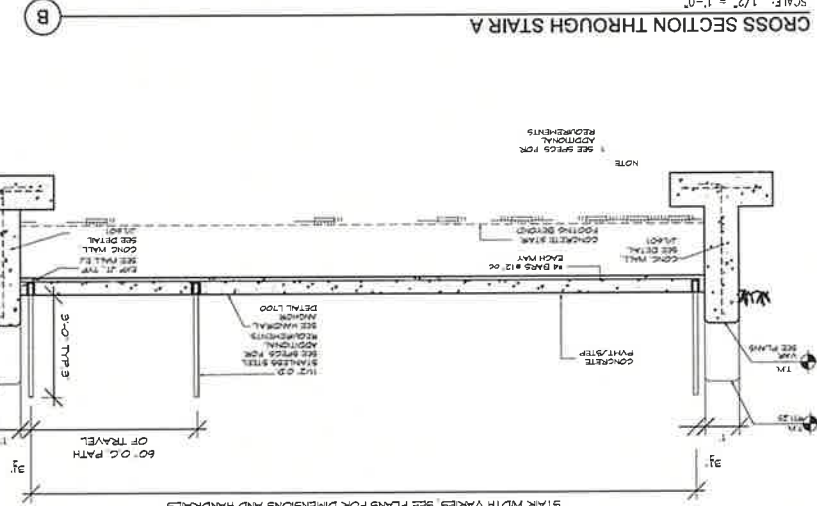
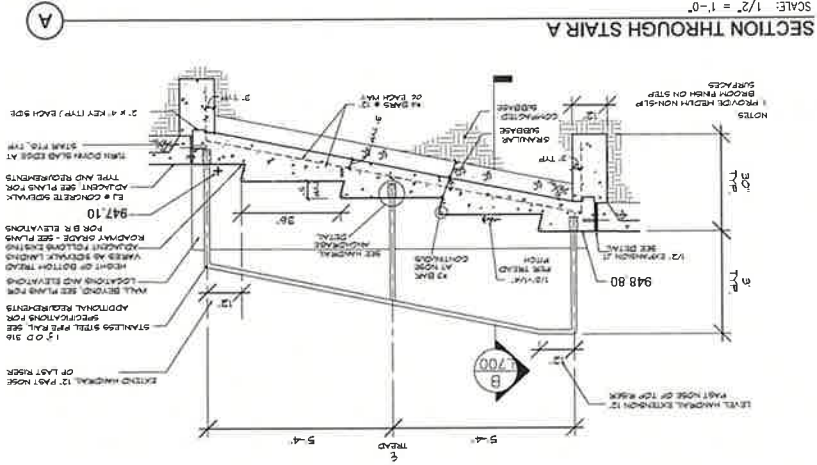
MANUFACTURER CONTACT:
JARRED BEALL
JARRED@LANDSCAPEFORMS.COM
LANDSCAPE FORMS, INC.
MOBILE 256-751-7510
WWW.LANDSCAPEFORMS.COM

INSTALLATION PROCESS

- POUR THE FOOTINGS.
- FLUSH AND LEVEL THE INTERNAL SIDE POSTS. BOLT THOSE POSTS BASE PLATES TO THE FOOTINGS.
- BOLT THE INTERNAL STRUCTURAL BEAM TO EACH POST, CONNECTING THE STRUCTURE TOGETHER. IF ANY LIGHTING OR ELECTRICAL OUTLETS ARE ADDED TO THE DESIGN, THIS SHOULD BE THE TIME FOR AN ELECTRICIAN TO RUN CONDUIT.
- BOLT THE OUTER PANELS TO THE STRUCTURAL POSTS AND BEAMS. THERE WILL BE A SEQUENCE TO KEEP THE PANELS HORIZONTAL.
- BOLT THE SWING ARMS TO THE STRUCTURAL BEAM. THERE WILL LIKELY BE AN EXTENSION HANGING DOWN FROM THE STRUCTURAL BEAM THAT WILL CLEAR THE OUTER PANELS, SO THAT EXTENSION PIECE MAY BE BOLTED ON DURING STEP 2.
- ENSURE THE SWING ARMS ARE LEVEL.
- BOLT THE SWINGS TO THE SWING ARMS.

(B)

<p>PHOENIX PARK REIMAGINED LFUGG PARKS AND RECREATION</p> <p>100 East Main Street Lexington, KY</p>		<p>Site Structure Information for Reference</p> <p>Sheet Title</p>
<p>Date: April 8, 2024</p> <p>Drawn by:</p> <p>Checked by:</p> <p>Revision:</p> <p>Revision:</p> <p>Revision:</p>	<p>CONSULTANTS:</p> <p>Gresham Smith Landscape Architecture Collaborative</p> <p>KFI Engineers Site Electrical Engineer</p>	<p>element design landscape architecture • civil engineering</p> <p>L605 Drawing No.</p>



Drawing No. L700	element design CONSULTANTS: Gresham Smith Lexington, KY 100 East Main Street	KFI Engineers Lexington, KY 100 East Main Street	DATE: April 2014
			DRAWN BY: CHECKED BY: REVISIONS:
Sheet Title: Stair & Ramp Details	PROJECT: PHOENIX PARK REIMAGINED LFUCG PARKS AND RECREATION	LOCATION: Lexington, KY 100 East Main Street	STATE OF KENTUCKY ARCHITECTS No. 10000

ELECTRICAL SHEET INDEX

Table with 2 columns: Symbol Number and Description. Includes E000 ELECTRICAL SYMBOLS, E001 ELECTRICAL DEMO SITE PLAN, E011 ELECTRICAL SITE PLAN, E201 ELECTRICAL DETAILS AND SCHEDULES.

Main table of electrical symbols and their descriptions. Columns include: Symbol, Description, and Notes. Categories include GENERAL, LIGHTING SYSTEMS, FIRE ALARM SYSTEMS, POWER SYSTEMS, LIGHTING CONTROL SYSTEMS, AUDIO VIDEO SYSTEMS, SECURITY SYSTEMS, TECHNOLOGY SYSTEMS, DATA RACK/EQUIPMENT, and PANELBOARD IDENTIFICATION.

ELECTRICAL ABBREVIATIONS table. Columns include: Symbol, Description, and Notes. Lists abbreviations for various electrical components like AND, AT, CENTERLINE, etc.

GENERAL ELECTRICAL PLAN NOTES

- 1. INSTALL ELECTRICAL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE, STATE, COUNTY, MUNICIPAL AND FEDERAL LAWS AND ORDINANCES GOVERNING THE PROJECT. IF THE PLANS AND SPECIFICATIONS ARE IN DIRECT CONFLICT WITH SUCH CODES, LAWS OR ORDINANCES, NOTIFY THE ENGINEER OF CONFLICT IN WRITING PRIOR TO MAKING CHANGES FROM PLANS AND/OR SPECIFICATIONS. WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A LICENSED MASTER ELECTRICAL LICENSEE IN THE STATE IN WHICH THE WORK WILL OCCUR.
2. BRANCH CIRCUIT CONDUITS, JUNCTION BOXES AND CONNECTIONS ARE NOT SHOWN. PROVIDE COMPLETE RACEWAY SYSTEM AND CONDUITS AS REQUIRED FOR THE INDICATED CIRCUITS.
3. ALL HOUGH FEEDER AND BRANCH CIRCUIT WIRING AND CONDUIT ARE NOT SPECIFICALLY SHOWN. PROVIDE A COMPLETE FEEDER AND BRANCH CIRCUIT WIRING SYSTEM.
4. HOUSING CIRCUITS SHALL BE 1/2" RICH CONDUIT, 7/12" 1/2" GROUND W/1/2" TO A 20AMP CIRCUIT BREAKER IN DESIGNATED PANEL. THE NUMBERS SHOWN AT EACH DEVICE REPRESENT BRANCH CIRCUIT NUMBER(S) IN PANEL BOARD.
5. EXTERIOR LUMINAIR/DEVICE CONTROLS SHALL BE 1" INCH CONDUIT, 3/16" 1/2" GROUND W/1/2" TO 20AMP CIRCUIT BREAKER IN DESIGNATED PANEL. THE NUMBERS SHOWN AT EACH DEVICE REPRESENT BRANCH CIRCUIT NUMBER(S) IN PANEL BOARD.
6. ALL CONDUIT AND WIRING SIZES SHOWN ARE MINIMUMS, DEPENDING ON EXACT ROUTING, OTHER DETAILED AND OTHER TRADES. PROVIDE TEMPORARY PROTECTIVE COVERINGS TO REMAIN AND ARE SHOWN FOR REFERENCE ONLY.
7. WALLETS AND RACEWAY SIZES INDICATED ON HOUSING/CIRCUITS SHALL BE CONTINUOUS FOR ENTIRE LENGTH.
8. A MAXIMUM OF THREE CIRCUITS SHALL BE INSTALLED IN A CONDUIT.
9. PROVIDE DEDICATED NEUTRAL FOR EACH SINGLE PHASE CIRCUIT.
10. RACEWAYS SHALL BE LIMITED TO SIX CURRENT CARRYING CONDUCTORS (THREE PHASE AND THREE NEUTRALS) AND GROUNDING CONDUCTOR.
11. CONDUCTORS MUST BE SEPARATED PER THE NATIONAL ELECTRICAL CODE WHEN MORE THAN THREE CURRENT CARRYING CONDUCTORS ARE RUN IN THE SAME RACEWAY.
12. INSTALL WIRING CONCEALED IN RACEWAYS AND CONCEAL RACEWAYS IN WALLS, FLOORS AND CEILING. NO SURFACE RACEWAYS SHALL BE INSTALLED ON NEW FINISHED WALLS, CEILING OR FLOOR.
13. CABLING THAT IS NOT IN CONDUIT AND IS LOCATED IN AIR HANDLING PLenums SHALL BE PLenum RATED. REFER TO MECHANICAL PLANS FOR PLenum AREAS.
14. DO NOT INSTALL ELECTRICAL EQUIPMENT THAT PHYSICALLY INTERFERES WITH SERVICES OF MECHANICAL EQUIPMENT.
15. ELECTRICAL CONDUITS, WIRING, BOXES, ETC. SHALL NOT PENETRATE STAIR ENCLOSURE UNLESS THEY ARE FEEDING DEVICES LOCATED WITHIN THE STAIR ENCLOSURE.
16. PROVIDE ELECTRICAL OUTLET PLATE GASKET SEALS AT RECEPTACLES, SWITCHES, OTHER ELECTRICAL BOXES OR ENCLOSURES WALLS AND WINDOW WALLS TO BE CONDITIONED AND UNCONDITIONED SPACES.
17. PROVIDE UNIVERSAL BLANK PLUGS ON SPARE CONDUITS USED FOR CONDUIT.
18. SEAL CONDUITS AT THE LAST STRUCTURE PRIOR TO CONDUITS ENTERING A BUILDING AND WHERE CONDUITS ENTER A BUILDING. INSTALL NYLON PULL STRANG AND FOOTAGE TAPE IN SPARE CONDUITS.
19. RACEWAY AND WIRING INDICATED ON THE DRAWINGS ARE RECOMMENDATIONS FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR EXACT ROUTING.
20. 120 VOLT BRANCH CIRCUITS OVER 100 FEET IN CONDUIT LENGTH SHALL BE INCREASED ONE WIRE SIZE OVER CIRCUIT AMPACITY AND CIRCUITS OVER 170 FEET IN CONDUIT LENGTH SHALL BE INCREASED TWO WIRE SIZES.
21. ELEVATIONS AND HEIGHTS ON ELECTRICAL DRAWINGS AND SPECIFICATIONS ARE APPROXIMATE. FOR WALL MOUNTED DEVICES REFER TO ARCHITECTURAL REFLECTED CEILING PLAN.
22. PAINT CONDUIT AND BOXES WHERE CONDUIT OR BOXES ARE VISIBLE IN FINISHED SPACES. COORDINATE WITH OTHER TRADES.
23. PROVIDE NEW, FIRST QUALITY MATERIAL FOR ALL PRODUCTS PROVIDED UNDER THIS CONTRACT.
24. NO MORE THAN AN EQUIVALENT OF 270 DEGREES OF BEND IS ALLOWED IN A CONTINUOUS CONDUIT RUN BETWEEN JUNCTION BOXES OR PULL BOXES.

GENERAL ELECTRICAL DEMOLITION NOTES

- 1. DRAWINGS ARE FOR INFORMATION ONLY AND ARE NOT INTENDED TO INDICATE ALL DEVICES OR CONDITIONS ASSOCIATED WITH DEMOLITION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ACTUAL CONDITIONS INVOLVED IN THE DEMOLITION AND SUBSEQUENT RECONSTRUCTION REQUIRED TO COMPLETE THE ELECTRICAL INSTALLATION.
2. SEE ARCHITECTURAL GENERAL DRAWINGS AND SPECIFICATIONS FOR PHASES OF DEMOLITION.
3. CIRCUIT CONTINUITY SHALL BE MAINTAINED TO ELECTRICAL LIGHTING DEVICES AND WIRING AS NECESSARY TO MAINTAIN CONTINUITY TO EXISTING EQUIPMENT AND DEVICES. FIELD VERIFICATION OF BRANCH CIRCUIT CONFIGURATION SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
4. IN AREAS OF DEMOLITION REMOVE ASSOCIATED JUNCTION BOXES, SUPPORTS, CONDUIT AND WIRING TO THE POINT OF ORIGIN FOR LIGHTING, DEVICES AND EQUIPMENT NOT BEING REUSED.
5. FOR CIRCUITS/SHOES/BOXES WITH ONLY A PORTION DEMOLISHED, REMOVE CONDUIT AND CONDUCTORS BACK TO THE NEAREST JUNCTION BOX FEEDING CIRCUITS THAT MAINTAIN POWER TO EQUIPMENT AND RECEPTACLES THAT WILL REMAIN AFTER DEMOLITION OR REQUIRE POWER DURING DEMOLITION AND CONSTRUCTION.
6. FOR CIRCUITS/SHOES/BOXES WITH ALL DEVICES DEMOLISHED, REMOVE CONDUIT AND CONDUCTORS BACK TO THE PANEL BOARD SERVING CIRCUIT(S).
7. DASHED ELECTRICAL DEVICES INDICATE DEVICES THAT ARE TO BE DEMOLISHED. SOLID BOLD LINES ELECTRICAL DEVICES INDICATE DEVICES THAT ARE NEW. SCREENED LINES UNDER ELECTRICAL DEVICES INDICATE DEVICES THAT ARE EXISTING TO REMAIN AND ARE SHOWN FOR REFERENCE ONLY.
8. WALLS, CEILING AND GENERAL MATERIALS SHALL BE DEMOLISHED BY GENERAL DEMOLITION CONTRACTOR. DEMOLISH ELECTRICAL LUMINAIRES, DEVICES AND EQUIPMENT PRIOR TO REMOVAL OF WALLS AND CEILING. RELOCATE SYSTEMS AS INDICATED ON DRAWINGS OR AS REQUIRED FOR INSTALLATION OF NEW WALLS OR CEILING. COORDINATE WITH STRUCTURAL INSTALLATION, ARCHITECTURAL, MECHANICAL AND OTHER TRADES. PROVIDE TEMPORARY PROTECTIVE COVERINGS, CIRCUIT BREAKERS, AUTOMATIC TRANSFER SWITCHES, ETC. THE ELECTRICAL EQUIPMENT SHALL BE PROPERLY RATED FOR THE AVAILABLE FAULT CURRENT AND FULLY COORDINATED WHERE REQUIRED.
9. EXISTING CONDUIT HOLES OR SLEEVES INSTALLED IN CONCRETE FLOORS OR WALLS THAT ARE ABANDONED AFTER DEMOLITION SHALL HAVE CONDUIT REMOVED AND HOLES FILLED AND PATCHED. PROVIDE PATCHING AND PAINTING AS REQUIRED. SEE ARCHITECTURAL TYPICAL DETAIL.
10. COORDINATE THE DEMOLITION OF LUMINAIRES, DEVICES AND EQUIPMENT WITH OTHER CONTRACTORS. DEMOLISH POWER, FIRE ALARM, ELECTRICAL CONTROLS, AND INSTRUMENTATION WIRING OF EQUIPMENT BEING DEMOLISHED. RELOCATE, EXTEND AND RECONNECT POWER, FIRE ALARM, ELECTRICAL CONTROLS, AND INSTRUMENTATION WIRING OF EQUIPMENT BEING RELOCATED. COORDINATE REMOVAL AND RELOCATION OF POWER AND CONTROLS OF MECHANICAL EQUIPMENT WITH RESPECTIVE CONTRACTORS.
11. VERIFY EXISTING CONDITIONS BEFORE COMMENCING DEMOLITION OF AN AREA. WHERE NEEDED DURING CONSTRUCTION FOR PHASING, TEMPORARILY RECONNECT CIRCUITS AND DEVICES AFTER DEMOLITION UNTIL PERMANENT INSTALLATION IS COMPLETED. DEMOLISH AFTER INSTALLATION IS COMPLETED.
12. COORDINATE DEMOLITION OF EXISTING WALLS, CEILING AND FLOORS WITH DEMOLITION CONTRACTOR.
13. SEAL OPENINGS IN BOXES AND ENCLOSURES THAT HAVE CONDUIT REMOVED AND OPENINGS THAT ARE NOT REUSED. PROVIDE BLANK COVER PLATES ON ALL JUNCTION BOXES AND ENCLOSURES THAT HAVE DEVICES DEMOLISHED BUT BOXES ARE EXISTING TO REMAIN.
14. PROVIDE MULTIPLE POLE CIRCUIT BREAKER(S) OR REPLACE WIRING WITH DEDICATED NEUTRALS WHERE EXISTING MULTIPHASE CIRCUITS ARE WORN OUT.
15. DEMOLISH ALL ELECTRICAL DEVICES AND BOXES AS NECESSARY WHERE NEW WALL CONSTRUCTION WILL INTERSECT AN EXISTING WALL.
16. DEMOLISH ALL EQUIPMENT IN A MANNER THAT WILL NOT DESTROY OR DAMAGE EQUIPMENT OR DEVICES THAT ARE TO BE SALVAGED. EXISTING TO REMAIN OR BE RELOCATED.
17. REPLACE ALL CONDUITS AND RACEWAYS THAT ARE DAMAGED DURING CONSTRUCTION.
18. DEMOLISH OR RELOCATE LIGHTING CONTROLS, EXIT SIGNAGE, AND ACCESS CONTROLS AS NECESSARY TO ACCOMMODATE NEW DOOR CONFIGURATIONS.
19. PROVIDE CONDUIT AND COMMUNICATIONS CABLES AS NECESSARY FOR A COMPLETE CABLES SYSTEM TO DEVICE LOCATIONS EXISTING TO REMAIN AFTER DEMOLITION.
20. DO NOT REMOVE MATERIALS (CONDUIT, CABLING, WIRING, DEVICES, SUPPORTS, EQUIPMENT, ETC.) UNLESS SPECIFICALLY INDICATED OR APPROVED BY THE ENGINEER. CONCEALED CONDITIONS IN WHICH THE CONTRACTOR COULD NOT ANTICIPATE THE EFFORT LEVEL REQUIRED SHALL BE BROUGHT PROMPTLY TO THE ENGINEER'S ATTENTION. IF THE CONTRACTOR WILL REQUEST A CHANGE IN CONTRACT AMOUNT OR CONTRACT TIME DUE TO CONDITIONS, THEN THE CONTRACTOR SHALL SUBMIT DIGITAL PHOTOGRAPHS OF THE EXISTING CONDITIONS WITH A PROPOSED RESOLUTION. FAILURE TO DO SO IMPRESSES THE CONTRACTOR HAS ASSUMED THE WORK EFFORT TO BE INCLUDED IN THEIR BID. ENGINEER WILL PROMPTLY REVIEW INFORMATION AND MAKE RECOMMENDATIONS TO THE OWNER IN AN ATTEMPT TO MAINTAIN CONSTRUCTION SCHEDULE.

GENERAL POWER NOTES

- 1. COORDINATE LOCATION OF ELECTRICAL DEVICES SUCH AS RECEPTACLES, SWITCHES, WIRING DEVICES, ETC. WITH ARCHITECTURAL PLANS, ELEVATIONS AND DETAILS PRIOR TO START OF WORK. REQUEST CLARIFICATIONS FROM ARCHITECT PRIOR TO INSTALLATION.
2. PROVIDE OF TYPE PROTECTION OR PERSONNEL CIRCUIT BREAKER TO FEED A NORMAL NON-GFCI RECEPTACLE IF RECEPTACLE IS DESIGNATED OFF BUT IS NOT NEARLY ACCESSIBLE (SUCH AS BEING LOCATED BEHIND PERMANENTLY INSTALLED EQUIPMENT OR REQUIRES A TOOL OR LADDER TO ACCESS IT).
3. COORDINATE LOCATION OF JUNCTION BOXES FOR EQUIPMENT THAT IS FURNISHED BY OTHERS. COORDINATE WITH THE EQUIPMENT SUPPLIER PRIOR TO INSTALLATION. PROVIDE WIRING FROM JUNCTION BOX TO EQUIPMENT CONNECTION AS REQUIRED.
4. WIRING INDICATED BY CIRCUIT NUMBER SYMBOL SHALL INCLUDE A NEUTRAL WHEN THE LOAD SERVED HAS PROVISIONS FOR, OR REQUIRES A NEUTRAL. TYPICALLY FEEDERS AND BRANCH CIRCUITS WILL REQUIRE A NEUTRAL, EXCEPT MOST MOTOR CIRCUITS.
5. WHERE CIRCUITING IS NOT SHOWN, CONNECT CONVENIENCE RECEPTACLES SUCH THAT NO MORE THAN 6 RECEPTACLES (POLES) ARE ON A CIRCUIT. CONNECT TO THE NEAREST 100AMP PANEL SERVING THE AREA SHOWN.
6. FOR RECEPTACLE DEVICES AND JUNCTION BOXES THAT ARE SHOWN TAGGED (IE. EOC, AV OR AP4) REFER TO SPECIFICATION OF MECH, ARCH OR OTHER DISCIPLINES OR DRAWINGS FOR LOADS REQUIRED OR SPECIAL PURPOSE RECEPTACLES NEEDED. IF CIRCUIT IS NOT SHOWN ON PLAN DRAWING OR PANEL SCHEDULE, PROVIDE CIRCUIT OF SIZE AND REQUIREMENTS PER EQUIPMENT SUPPLIER. PROVIDE INDIVIDUAL DEDICATED 100V 20A CIRCUIT IF LOAD IS NOT KNOWN OR AVAILABLE FROM EQUIPMENT SUPPLIER. COORDINATE WITH EQUIPMENT SUPPLIERS AND OTHER CONTRACTORS AS REQUIRED.
7. REFER TO SPECIFICATIONS AND PROVIDE POWER SYSTEM STUDIES AS A PART OF THIS CONTRACT. SUBMIT POWER STUDIES RESULTS WITH THE SUBMITTAL OF ELECTRICAL GEAR (CIRCUIT BREAKERS, PANELBOARDS, TRANSFORMERS, CIRCUIT BREAKERS, AUTOMATIC TRANSFER SWITCHES, ETC.) THE ELECTRICAL EQUIPMENT SHALL BE PROPERLY RATED FOR THE AVAILABLE FAULT CURRENT AND FULLY COORDINATED WHERE REQUIRED.

GENERAL ELECTRICAL SITE NOTES

- 1. NOTIFY AFFECTED UTILITY PROVIDERS AND LOCATE CUSTOMER OWNED UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF WORK.
2. THE LOCATION AND QUANTITY OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES DUE TO FAILURE TO LOCATE AND PRESERVE UNDERGROUND UTILITIES INCLUDING CUSTOMER OWNED SITE UTILITIES.
3. PROVIDE ALL TREENING AND BACKFILLING AS PER DIVISION 02.
4. RESTORE TO ORIGINAL GRADE AND PROVIDE SOODGRASS IN ALL CUT/EXCAVATED AREAS.
5. PROVIDE ALL CONCRETE PADS FOR ELECTRICAL EQUIPMENT AS PER DIVISION 03.
6. MAINTAIN MINIMUM OF 30" FROM FINISHED GRADE TO TOP OF UNDERGROUND DUCT BANKS AND UNDERGROUND CONDUIT RUNS.
7. EXISTING CONDUIT, WIRING, ETC. ROUTED THROUGH AREAS TO BE EXCAVATED SHALL BE RE-ROUTED AS REQUIRED TO ENSURE CONTINUITY OF EXISTING CIRCUITS TO REMAIN.
8. REMOVE ABANDONED ELECTRICAL CONDUITS AND CONDUITS IN AREAS TO BE EXCAVATED. REMOVE ALL CONDUITS OR ABANDONED THROUGH THE CONTRACT. WHERE CONDUIT IS NOT IN AN AREA BEING EXCAVATED, CONDUIT MAY BE ABANDONED IN PLACE AND GAPPED.
9. EXISTING UTILITIES SHALL REMAIN TO SERVE EXISTING STRUCTURES UNTIL THEY ARE VACATED. PROVIDE TEMPORARY SERVICES AS REQUIRED.
10. PROVIDE EMPTY CONDUITS WITH NYLON PULL STRINGS AND METALLIC CAPS.
11. REFER TO SITE ARCHITECTURAL, LANDSCAPING AND CIVIL ENGINEERING PLANS FOR ADDITIONAL INFORMATION, DETAILS AND LOCATIONS OF EQUIPMENT.
12. WHERE PVC CONDUIT, WHETHER DIRECT BURIED OR IN DUCT BANK, TERMINATES WITHIN A BUILDING OR UTILITY STRUCTURE, THE PVC CONDUIT SHALL TRANSITION TO RIGID METAL CONDUIT AT LEAST 10 FEET PRIOR TO ENTERING THE BUILDING UTILITY STRUCTURE.
13. PROVIDE UPS COORDINATES ON AS-BUILT DRAWINGS FOR ALL MANHOLES, HANDHOLES, POLES, SPARE CONDUITS AND ELECTRICAL EQUIPMENT.


PHOENIX PARK REIMAGINED
LFUGG PARKS AND RECREATION
100 East Main Street
Lexington, KY

ELECTRICAL SYMBOLS
Sheet Title

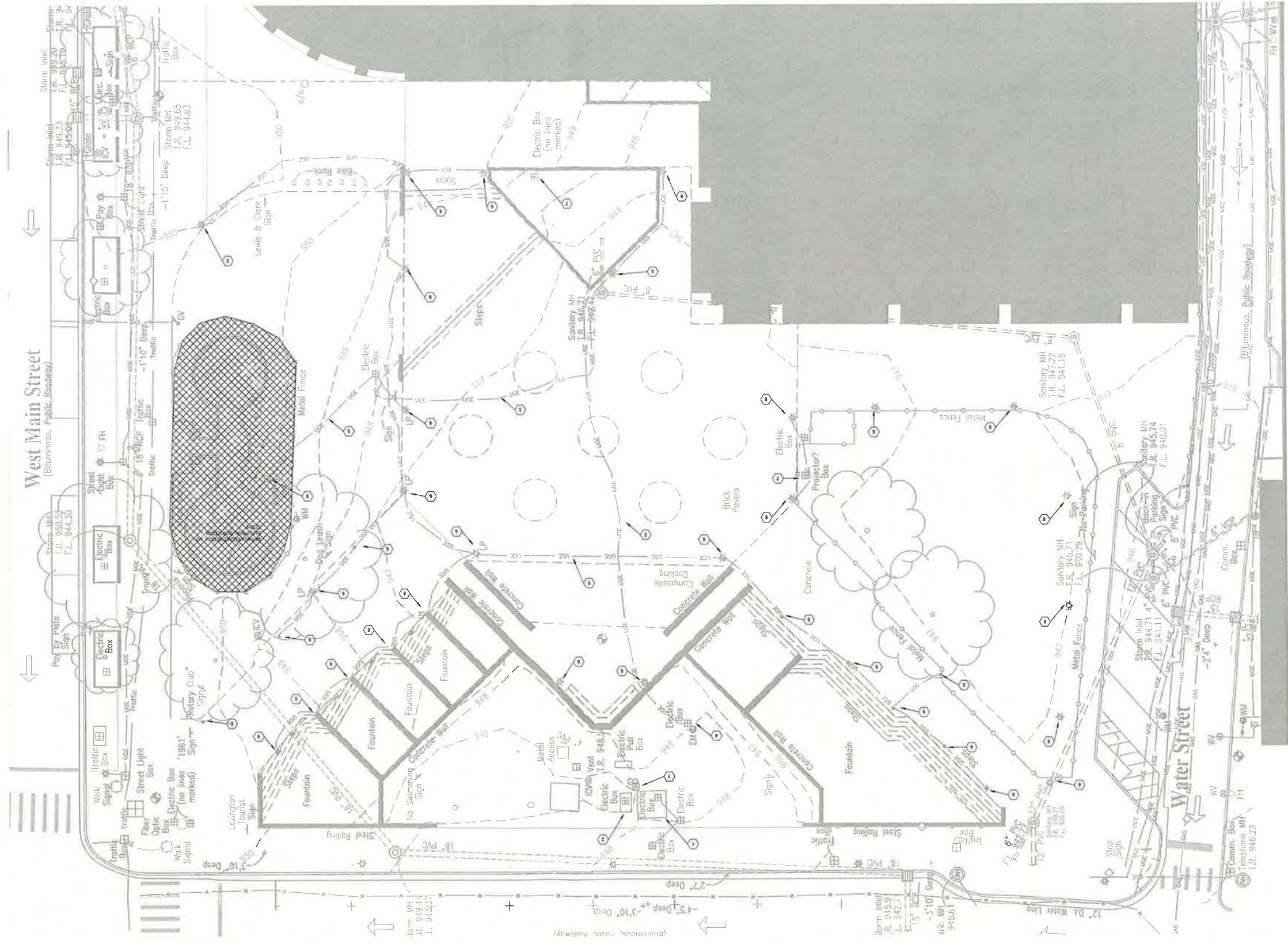
Date: April 2024
Drawn by: SNE
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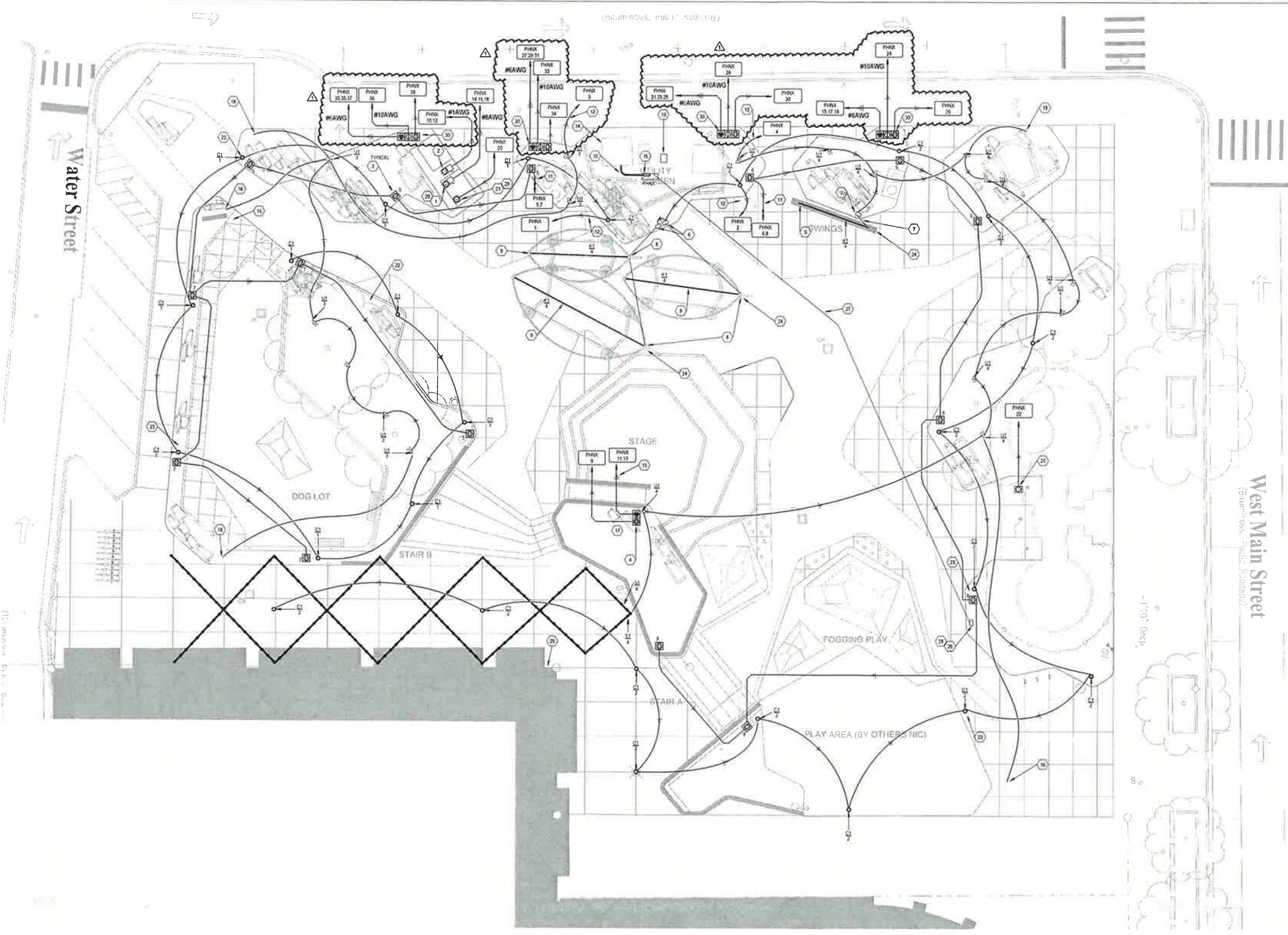
1 ELECTRICAL SITE PLAN
1" = 10'-0"



KEY NOTES

1. EXISTING UTILITY TRENCH DECKS TO REMAIN AND BE REUSED.
2. EXISTING TELECOMMUNICATIONS FULL BOX TO REMAIN.
3. DEMONISH BACK TO SOURCE.
4. ALL ELECTRICAL AND ELECTRICAL WIRING AND EQUIPMENT ARE TO BE DEMONISHED AND REUSED IN NEW WORK. CONDUITS ARE TO BE DEMONISHED AND REUSED IN NEW WORK.
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<p>PHOENIX PARK REIMAGINED LEUGG PARKS AND RECREATION 100 East Main Street Lexington, KY</p>		<p>CONSULTANTS: Gresham Smith Lexington, Kentucky</p>	<p>KFI ENGINEERS 2100 Lexington Road Lexington, KY 40503 781-444-4444 www.kfiengineers.com</p>	<p>element design</p>	<p>Drawing No. E001</p>
		<p>DATE: April 2024</p> <p>DRAWN BY: MS</p> <p>CHECKED BY: MS</p> <p>REVISION:</p> <p>REVISION:</p>	<p>CONTRACTOR: KFI ENGINEERS</p>	<p>PROJECT: PHOENIX PARK REIMAGINED</p>	<p>SHEET TITLE: ELECTRICAL DEMO SITE PLAN</p>



GENERAL NOTES:
 ALL UNDERGROUND CONDUITS ARE TO BE 3" MINIMUM BURY UNLESS OTHERWISE NOTED.
 UNLESS OTHERWISE NOTED, REQUIRED UNDERGROUND PULL BOXES ARE TO BE INSTALLED WITH HEAVY DUTY COVER FLUSH IN PAVEMENT. FINAL LOCATION OF BOXES ARE TO BE COORDINATED WITH ARCHITECT AND ENGINEER PRIOR TO INSTALLATION.

- KEY NOTES:**
1. PROVIDE CONNECTION TO FOGGING AREA PUMP WFD. COORDINATE WITH APPROVED SHOP DRAWINGS.
 2. PROVIDE CONNECTION TO RESTROOM BUILDING. COORDINATE WITH APPROVED SHOP DRAWINGS.
 3. POWER PEDESTAL, SEE SPECIFICATIONS.
 4. STAGE AREA POWER PEDESTAL, SEE SPECIFICATIONS. PEDESTAL IS TO HAVE TWO 1/4" CONDUITS BACK TO PANEL BOARD.
 5. LIGHT FIXTURE IS TO BE MOUNTED TO UNDERSIDE OF SWING STRUCTURE, AVOIDING HINGES.
 6. DIRECT BURIAL, POWER SUPPLY CENTER FOR SWING SETS LIGHT FIXTURE POWER SUPPLIES, EQUIVALENT TO Q-BRAN QUALITY.
 7. ROUTE 1/2" RIGID 2" PVC CABLE IN UNDERGROUND PVC CONDUIT TO BASE OF SWING STRUCTURE. ROUTE THROUGH STRUCTURE PATHWAY PROVIDED BY MANUFACTURER TO LIGHT FIXTURE.
 8. ROUTE 1/2" RIGID 2" PVC CABLE IN 3" UNDERGROUND PVC CONDUIT TO BASE OF SHADE STRUCTURE. ROUTE THROUGH STRUCTURE PATHWAY PROVIDED BY MANUFACTURER TO LIGHT FIXTURE.
 9. LIGHT FIXTURE IS TO BE MOUNTED TO UNDERSIDE OF SHADE STRUCTURE.
 10. APPROXIMATE 1" (NO END IN 3/4" CONDUIT FROM SECONDARY SIDE OF EXISTING 200V TRANSFORMER TO NEW PANEL BOARD.
 11. POWER PEDESTAL CIRCUITS ARE TO BE RAN WITH #10AWG IN A MINIMUM OF 1/4" CONDUIT.
 12. LIGHTING CIRCUITS ARE TO BE RAN WITH #10AWG IN A MINIMUM OF 1" CONDUIT.
 13. CIRCUIT IS TO BE RAN WITH #10AWG IN A MINIMUM OF 1/4" CONDUIT.
 14. EXISTING UTILITY TRANSFORMER TO REMAIN AND BE REUSED. COORDINATE WORK WITH L&E-ALL.
 15. NEMA 4X FREE STAND ELECTRICAL ENCLOSURE TO HOUSE PANEL BOARD AND DINX CONTROLLERS. RELOCATED METER IS TO BE MOUNTED TO EXTERIOR OF ENCLOSURE IN ACCESSIBLE LOCATION. SEE DETAIL.
 16. ROUTE SPARE 1/4" CONDUIT FOR FUTURE CHARGING STATION TO THIS LOCATION FROM PANEL BOARD. FOLLOW TRENCH MADE FOR LIGHTING POWER PEDESTAL. CIRCUITS CAP CONDUIT UNDERGROUND WITH UTILITY MARKER ON GRADE.
 17. ROUTE SPARE 7" CONDUIT FOR FUTURE USE TO THIS LOCATION FROM PANEL BOARD. FOLLOW TRENCH MADE FOR POWER PEDESTAL. CIRCUITS, CAP CONDUIT UNDERGROUND WITH UTILITY MARKER ON GRADE.
 18. SPARE 1" CONDUIT FOR FUTURE UPLIGHT FROM NEW UPLIGHT. CAP CONDUIT UNDERGROUND WITH UTILITY MARKER ON GRADE.
 19. UNDERGROUND QUARTZITE BOX FOR SECURITY CONDUIT TERMINATION. SEE SHEET NOTES 22-25 THIS SHEET.
 20. EXISTING UNDERGROUND ELECTRIC BOX FOR CONNECTION TO MONUMENTS IS TO REMAIN. PROVIDE NEW CIRCUIT IN 1" CONDUIT FROM BOX TO NEW PANEL BOARD. FIELD VERIFY.
 21. PROVIDE CONNECTION TO FOGGING AREA PUMP CONTROL PANEL. COORDINATE WITH APPROVED SHOP DRAWINGS. PROVIDE NECESSARY CONTROL CABLES FOR OPERATION.
 22. ROUTE TWO SPARE 1/4" CONDUIT FOR FUTURE CALL BOX TO THIS LOCATION FROM QUARTZITE BOX BEHIND UTILITY SCREEN. FOLLOW TRENCH MADE FOR LIGHTING POWER PEDESTAL. CIRCUITS, CAP CONDUIT UNDERGROUND WITH UTILITY MARKER ON GRADE.
 23. ROUTE SPARE 1/4" CONDUIT FOR FUTURE SECURITY DEVICES TO THIS LOCATION FROM QUARTZITE BOX BEHIND UTILITY SCREEN. CAP CONDUIT UNDERGROUND WITH UTILITY MARKER ON GRADE.
 24. ROUTE SPARE 1/4" CONDUIT FOR FUTURE SECURITY DEVICES TO BASE OF STRUCTURE PATHWAY FROM QUARTZITE BOX BEHIND UTILITY SCREEN.
 25. ROUTE SPARE 1/4" CONDUIT FOR FUTURE SECURITY DEVICES TO BASE OF EXISTING BUILDING WALL FROM QUARTZITE BOX BEHIND UTILITY SCREEN. CONDUIT IS TO BE CAPPED AT 4" ABOVE FINAL GRADE.
 26. DINX JUNCTION BOX FOR FOGGING SYSTEM NOZZLED LIGHTS. JUNCTION BOX IS TO BE PER LIGHTING MANUFACTURER'S RECOMMENDATION.
 27. DINX CABLES BETWEEN CONTROL PANEL IN ELECTRICAL ENCLOSURE AND FOGGING SYSTEM JUNCTION BOX IS TO BE RAN IN A MINIMUM OF TWO 3/4" CONDUITS.
 28. PROVIDE CONNECTION TO 112V FROM NOZZLED LIGHTS PER FOGGING SYSTEM DESIGN AND MANUFACTURER'S RECOMMENDATION. COORDINATE WITH APPROVED SHOP DRAWINGS.
 29. INFRASTRUCTURE FOR PUMP IS TO BE INSTALLED PRIOR TO RESTROOM BUILDING INSTALLATION. FINAL INSTALL OF DEVICES IS TO OCCUR AFTER BUILDING HAS BEEN COMPLETED.
 30. FOOD TRUCK POWER PEDESTAL, SEE SPECIFICATIONS. PEDESTAL IS TO HAVE TWO 1/4" CONDUITS BACK TO PANEL BOARD.

1 ELECTRICAL SITE PLAN
 E11 1" = 10'-0"

NOTE:
 IT IS NOT INTENDED THAT THE PLANS OF ALL OTHERS BY OTHER CONSULTANTS AND CONTRACTORS REQUIRED FOR INSTALLATION OF THE WORK, DETAILS AND EXHIBITS ARE EXCLUDED FOR SOME AREAS TO SHOW INTENDED RELATIONSHIP OF THE WORK OF VARIOUS TRADES IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SUBCONTRACTORS TO COORDINATE INSTALLATION OF THE WORK, AND TO PROVIDE THE NECESSARY DETAILS, TRANSFORMATIONS, AND FITTINGS. FIELD VERIFY NO ADDITIONAL COMMENTS WILL BE ALLOWED FOR CONFLICTS BETWEEN THE WORK OF VARIOUS TRADES. DETAILS AND SECTIONS ARE SHOWN FOR THE CONTRACTOR'S CONVENIENCE AND SHALL NOT BE CONSIDERED COMPLETE IN EVERY DETAIL.

	PHOENIX PARK REIMAGINED LFUCG PARKS AND RECREATION		ELECTRICAL SITE PLAN
	100 East Main Street Lexington, KY		
Date: April 18, 2024 Drawn by: MGL Checked by: MGL Revision: Revision: Revision:	CONSULTANTS: Gresham Smith Landscape Architecture Collaborator KFI Engineers Site Electrical Engineer	KFI ENGINEERS 2342 Alexander Drive Suite 200 Lexington, Kentucky 40504 Tel: (606) 271-2246 Email: kfi@kfi-engineers.com	element design knowledge. architecture. + civil engineering
			E011 Drawing No.

