

RESOLUTION NO. 2022-__

A RESOLUTION BY THE BOARD OF COUNTY COMMISSIONERS OF ST. JOHNS COUNTY, FLORIDA, AUTHORIZING THE COUNTY ADMINISTRATOR, OR DESIGNEE, TO AWARD BID NO: 22-34; NORTHWEST WELL NO. 7 WELLHEAD AND SITE IMPROVEMENTS TO SGS CONTRACTING SERVICES, INC., AS THE LOWEST, RESPONSIVE, RESPONSIBLE BIDDER, AND TO EXECUTE AN AGREEMENT FOR COMPLETION OF THE WORK.

RECITALS

WHEREAS, the scope of work for the Northwest Well No. 7 Wellhead and Site Improvements project requires the Contractor to furnish all labor, materials, equipment, and incidentals required to install the wellhead piping, the final well casing flange, an owner furnished vertical turbine well pump with a 50-HP motor, Variable Frequency Drive (VFD), an owner furnished 50 kW standby diesel generator sets and automatic transfer switch, associated appurtenances, raw water main, concrete well pad, instruments, controls, electrical equipment, all necessary soil and erosion control devices, construct the well site access road, pressure test and disinfect the well, and demolish electrical, instrumentation, and control work as shown on Drawings and detailed in the Specifications as provided in the Contract documents; and

WHEREAS, through the County’s formal Bid process SGS Contracting Services, Inc., was determined to be the lowest, responsive, responsible bidder; and

WHEREAS, the County has reviewed the terms, provisions, conditions and requirements of the proposed contract (attached hereto, an incorporated herein) and finds that entering into contract to complete the work serves a public purpose; and

WHEREAS, the project will be funded by the SJC Utility Department.

NOW, THEREFORE BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF ST. JOHNS COUNTY, FLORIDA, as follows:

Section 1. The above Recitals are incorporated by reference into the body of this Resolution and such Recitals are adopted as finds of fact.

Section 2. The County Administrator, or designee, is hereby authorized to award Bid 22-34; Northwest Well No. 7 Wellhead and Site Improvements project to SGS Contracting Services, Inc., as the lowest, responsive, responsible bidder.

Section 3. Upon Board approval, the County Administrator, or designee, is further authorized to execute an agreement with SGS Contracting Services, Inc., in the amount of \$414,700.00, in substantially the same form and format as the attached draft on behalf of the County to complete the project as specifically provided in Bid 22-34.

Section 4. To the extent that there are typographical and/or administrative errors that do not change the tone, tenor, or concept of this Resolution, then this Resolution may be revised without subsequent approval by the Board of County Commissioners.

PASSED AND ADOPTED by the Board of County Commissioners of St. Johns County, Florida, on this ____ day of _____, 2022.

**BOARD OF COUNTY COMMISSIONERS OF
ST. JOHNS COUNTY, FLORIDA**

ATTEST: Brandon J. Patty,
Clerk of the Circuit Court & Comptroller

By: _____
Henry Dean, Chair

By: _____
Deputy Clerk



MASTER CONSTRUCTION AGREEMENT
BETWEEN
ST. JOHNS COUNTY AND CONTRACTOR

Master Construction Agreement No: 21-MCS-SGS-15541

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This Master Construction Agreement (“Contract”) is made this ____ day of _____, 20____ (the “Effective Date”) by and between **ST. JOHNS COUNTY** (“County”), a political subdivision of the State of Florida, whose principal offices are located at 500 San Sebastian View, St. Augustine, FL 32084; and **SGS Contracting Services, Inc.** (“Contractor”), a company authorized to do business in the State of Florida, with its principal offices located at: PO Box 908, High Springs, FL 32655 , Phone: 386-361-5300, and E-mail: seth@sgscsi.com, for **BID NO: 22-34; CONSTRUCTION OF NW Well No. 7 Wellhead & Site Improvements**, hereinafter referred to as the “Project”.

In consideration of the mutual promises and covenants contained herein, the parties hereby agree as follows:

ARTICLE I CONTRACT DOCUMENTS

1.1 The Contract Documents

1.1.1 The Contract Documents consist of the following documents incorporated herein by reference:

- a) Master Construction Agreement
- b) Bid Documents and Bid Forms with all addenda thereto for Bid No. 22-34
- c) Notice to Proceed
- d) Specifications and Drawings approved and existing at the time of execution of this Contract
- e) Change Orders and Amendments to this Contract signed by the County
- f) Field Orders signed by the County’s Project Manager
- g) Bonds and Insurance furnished by Contractor

1.1.2 Documents not enumerated above are not Contract Documents and do not form part of this Contract. No terms, conditions, limitations or exclusions in Contractor’s bid/proposal documents or invoices shall be binding upon County or become part of the Contract Documents. Shop Drawings, Product Data, Samples and similar submittals (hereafter “Submittals”) are not Contract Documents. The County will review and take action upon Contractor's submitted Submittals but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of Submittals is not conducted for the purpose of determining the accuracy and completeness of other details, such as dimensions and quantities, nor for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of Contractor.

1.1.3 All Submittals (whether in hard or soft copy) prepared by or on behalf of Contractor in the course of the Work shall be the exclusive property of the County. Ownership of any proprietary information or intellectual property contained in such Submittals shall remain with Contractor. Contractor grants the County a perpetual, royalty-free, license to use, copy and allow third parties to use such Submittals and all proprietary information contained in them as may be required for the County’s internal business purposes including without limitation tendering, installing, operating, repairing, maintaining, modifying, reconstructing, replacing and/or upgrading the Work. Such license shall be capable of transfer and/or sub-licencing in whole or part without notice to or further consent of Contractor. Contractor shall not be held liable for reuse of Contractor’s Submittals by the County for purposes other than originally intended as stated in the Contract Documents.

1.2 Definitions

When the following terms appear in the Contract Documents, they shall have the following meaning:

1.2.1 Acceptance of the Work: Written acceptance of the Work by the County and the County’s Project Manager.

1.2.2 Addendum (Addenda): A document issued by the County during the bidding period which modifies, supersedes or supplements the Contract Documents.

1.2.3 Applicable Laws: All local, state, and federal laws, statutes, codes, ordinances, rules and regulations in effect at the time Work and Warranty Work is performed under this Contract.

1.2.4 Amendment: A written addition or modification of, or a waiver of a right or obligation under the terms of the Contract executed by the County and issued after execution of the Contract.

1.2.5 Claim: Any claim, liability, loss, demand, demand for arbitration, damage, lien, cause of action of any kind,

obligation, responsibility, cost, expense, royalty, fee, assessment, penalty, fine, judgment, interest or award, pending or threatened, whether arising by law, contract, tort, voluntary settlement or otherwise.

1.2.6 Change Order: A written order to Contractor executed by the County, issued after execution of this Contract, authorizing and directing a change in the Work or an adjustment in the Contract Price or the Contract Time, or any combination thereof.

1.2.7 Contract Price: The sum set forth in Article IV of this Contract shall constitute the Contract Price, as may be amended by Change Order. Unless otherwise approved by the County in writing, the Contract Price includes all taxes, including without limitation, income and withholding tax of any kind and sales tax imposed by the state or by the County and paid by Contractor or any Subcontractors with respect to sales of goods purchased for the performance of the Work.

1.2.8 Contract Time: The number of calendar days between commencement and completion of the Work, established in paragraph 3.1.1 of this Contract, as may be amended by Change Order.

1.2.9 Design: Those design services related to the Project prepared by the County or the County's consultants or other representatives, which shall, as may be required, be included in Contractor's Work.

1.2.10 Drawings: The graphic and pictorial portions of the Contract Documents, illustrating the design, location and dimensions of the Work, generally including but not limited to, plans, elevations, sections, details, general notes, schedules and diagrams.

1.2.11 Final Completion: Completion of all Work in compliance with the Contract Documents, as determined by the County, and issuance of a Final Certificate for Payment.

1.2.12 Jobsite: Any physical location or other place on, under, in, at or through which any aspect of the Work is performed.

1.2.13 Notice to Proceed: A written notice given by the County to Contractor fixing the date on which the Contract Time will commence to run and identifying the corresponding Substantial Completion and Final Completion dates.

1.2.14 Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by Contractor to illustrate materials or equipment for some portion of the Work.

1.2.15 Project: The total undertaking to be accomplished for County by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

1.2.16 Project Manager: The County's representative assigned to the Project, or any part thereof, to observe the Work and perform certain other obligations of the County as defined in Article VI below.

1.2.17 Shop Drawings: Drawings, diagrams, schedules, and other data specially issued for the Work by Contractor or a Subcontractor, Sub-subcontractor, and material suppliers to illustrate some portion of the Work.

1.2.18 Specifications: That portion of the Contract Documents consisting of the written requirements for materials, standards, equipment, construction systems, and standards of workmanship for the Work, and performance of related services.

1.2.19 Subcontractor: A Subcontractor is an individual, partnership, corporation, association, joint-venture or any combination thereof, which has a direct or indirect contract with Contractor to perform a portion of the Work.

1.2.20 Substantial Completion: The stage in the progression of the Work when the Work is sufficiently complete in accordance with this Contract so that the County can enjoy beneficial use or occupancy of the Work and can utilize the Work for its intended purpose.

1.2.21 Work: Construction and services required by the Contract Documents, including all labor, materials, equipment and services as well as other deliverables provided, or to be provided, by Contractor to fulfill Contractor's obligations

under this Contract. The Work may constitute the whole or part of the Project.

1.3 Independent Contractor

Contractor represents that it is fully experienced and properly qualified, licensed, equipped, organized, and financed to perform the Work under this Contract. Contractor shall act as an independent contractor and not as an agent in performing this Contract and shall maintain complete control over its employees and all of its Subcontractors and suppliers of any tier. Nothing contained in this Contract or any lower-tier subcontract or purchase order awarded by Contractor shall create any contractual relationship between any such subcontractor or supplier and the County. Contractor shall perform all Work in accordance with the requirements of this Contract and in accordance with its own methods subject to compliance with this Contract.

1.4 Contractor's Continuing Duty

1.4.1 Contractor shall have a continuing duty to read, carefully study and compare each of the Contract Documents, the Submittals and shall give immediate written notice to the Project Manager and the County of any inconsistency, ambiguity, error or omission which Contractor may discover with respect to these documents before proceeding with the affected Work. The issuance, or the express or implied approval by the County or the Project Manager of the Contract Documents or Submittals shall not relieve any such approval by evidence of Contractor's compliance with the Contract. The County has requested the Project Manager to provide to Contractor documents for the Project, including the Drawings and Specifications for the Project, which are accurate, adequate, consistent, coordinated, and sufficient for construction. **HOWEVER, THE COUNTY MAKES NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO CONTRACTOR CONCERNING SUCH DOCUMENTS.** By the execution hereof, Contractor acknowledges and represents that it has received, reviewed and carefully examined such documents, has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, and that Contractor has not, does not, and shall not rely upon any representation or warranties by the County concerning such documents as no such representation or warranties have been or are hereby made.

1.4.2 In resolving conflicts between any of the Contract Documents, the following priorities shall govern:

- a) Supplementary conditions, if any, shall govern over the terms of this Contract;
- b) The terms of this Contract shall govern over all Bid Documents, Drawings and Specifications;
- c) Specifications shall govern over Drawings;
- d) Numerical dimensions shall govern over dimensions obtained by scaling; and
- e) Larger scale Drawings shall govern over smaller scale Drawings.

1.4.3 Should Contractor have any questions concerning interpretation or clarification of the Contract Documents, Contractor shall immediately submit to the Project Manager in writing a request for clarification that clearly and concisely sets forth the issues for which such request is sought. The County will render its determination concerning such interpretation or clarification, which determination shall be considered final and conclusive unless Contractor files a written protest pursuant to Section 1.5 titled "Disputes". Contractor's protest shall state clearly and in detail the basis thereof. The County will consider Contractor's protest and render its decision thereon within twenty-one (21) calendar days. If Contractor does not agree with the County's decision, Contractor shall immediately deliver written notice to that effect to the County.

1.5 Disputes

1.5.1 Contractor is solely responsible for requesting instructions, interpretations or clarifications and is solely liable for any cost and/or expenses arising from its failure to do so. Any dispute relating to a question of fact arising under this Contract shall be resolved through good faith efforts upon the part of Contractor and the County. Unless otherwise directed in writing, Contractor shall at all times carry on the Work and maintain its progress schedule in accordance with the requirements of the Contract and the determination of the County, pending resolution of any dispute. Any dispute that is not disposed of by mutual agreement shall be decided by the County who shall reduce such decision to writing. The decision of the County shall be final and conclusive. Contractor's failure to protest the County's determinations, instructions, clarifications or decisions within fourteen (14) calendar days after receipt thereof shall constitute a waiver by Contractor of all its rights to further protest, judicial or otherwise.

1.5.2 In no event will a dispute, the filing of a protest, claim or appeal, or the resolution or litigation thereof, relieve Contractor from its obligations to timely perform the Work required by the Contract and to maintain the progress schedule in accordance with the Contract.

1.6 Ownership of Contract Documents

Any and all Contract Documents shall remain the property of the County. Contractor is granted a limited license to use and reproduce applicable portions of the Contract Documents issued by the County appropriate to, and for use in, execution of the Work. Contractor shall have the right to keep one record set of the Contract Documents upon completion of the Work; provided, however, that in no event shall Contractor and/or Contractor's subcontractors use, or permit to be used, any or all of such Contract Documents on other projects without the specific written consent of the County.

ARTICLE II THE WORK

2.1 Labor and Materials

2.1.1 Contractor shall perform all of the Work required, implied, or reasonably inferable from, the Contract Documents. Unless otherwise provided in the Contract Documents, Contractor shall provide and pay for all labor, supervision, materials, supplies, tools, transportation, storage, construction equipment and machinery, utilities (including but not limited to water, heat, fuel, light, and cooling), and all other services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Materials, articles and equipment furnished by Contractor for incorporation into the Work shall be new unless otherwise specified in the Contract Documents.

2.1.2 Contractor shall use only competent and skilled personnel to perform and supervise the Work and shall remove from such Work any person determined to be unfit, unqualified, or acting in violation of any obligation of Contractor under this Contract. In the event a person is removed from the Work, Contractor shall promptly replace such individual with another who is fully competent and skilled to perform the Work at Contractor's sole expense.

2.1.3 Except as otherwise required for the safety or protection of persons or the Work or property at the Jobsite or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Jobsite shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with the County's prior written consent, which will not be unreasonably withheld.

2.1.4 In addition, when the Work requires by Florida Statute, Contractor shall use only licensed, registered and/or certified personnel to perform the Work. Such Statutes may include, but are not limited to, Chapter 489 (Regulation of Professions and Occupations Contracting) and Chapter 633, Part III (Fire Protection and Suppression) of the Florida Statutes.

2.2 Project Sequencing/Arrangement

Contractor shall not be limited in the sequencing or staging of the Work except to the extent that the Contract Documents impose limitations. Neither the organization of any of the Contract Documents into divisions, sections, paragraphs, articles, (or other categories), nor the organization/arrangement of the Drawings or Design, shall control Contractor in dividing the Work or in establishing the extent or scope of Work to be performed by Subcontractors.

2.3 Payment of Costs

Except as otherwise expressly provided, Contractor shall pay directly all costs and expenses of the Work of any kind or nature whatsoever including but not limited to all costs of permitting, regulatory compliance, obtaining and maintaining required bonds and insurance pursuant to Article 12, payments due to Subcontractors and suppliers, legal, financial, sales, use and similar taxes on materials and equipment, transportation and storage of materials and equipment, preparation of schedules, budgets and reports and all other costs required to achieve Substantial Completion and Final Completion.

2.4 Cleaning the Jobsite

Contractor shall keep the Jobsite neat, secure and orderly during performance of the Work and shall clean up and remove all waste, rubbish and construction debris from the Jobsite as they accumulate. Upon Final Completion of the Work, Contractor shall remove all waste, rubbish and construction debris from and about the Jobsite as well as all tools, appliances, construction equipment, temporary utilities, temporary construction and machinery and surplus materials. Contractor shall restore to original condition all property not designated for alteration by the Contract Documents.

2.5 Reporting Requirements

2.5.1 Daily Record. The Contractor shall keep a daily record of the Work at the Jobsite. At a minimum the Daily Record shall include weather conditions, number of workers (by trade) on the Jobsite, and material/equipment deliveries. Daily Records shall be submitted by close of business the following day.

2.5.2 Monthly Report. The Contractor shall prepare and submit a written monthly report by the tenth day of each calendar month. Monthly reports shall at a minimum describe Work completed in the prior month, planned Work for the current month, detailed explanations of any activity that is behind schedule, corrective actions taken to recover schedule, safety and environmental incidents and corrective actions taken.

2.6 Title and Risk of Loss

Title to the structures, improvements, fixtures, machinery, equipment and materials constituting the Work or the Project shall pass to the County no later than time of payment. Such transferred title shall in each case be good, free and clear of any and all security interests, liens or other encumbrances. Contractor shall, however, bear all risk of loss concerning such structures, improvements, fixtures, machinery, equipment and materials until Substantial Completion, regardless of the extent to which the loss was insured or the availability of insurance proceeds. The transfer of title does not imply acceptance by the County nor does it relieve Contractor from the responsibility for any loss or damage to items.

2.7 Access to Work

The County and the Project Manager, shall at all reasonable times have full access to all parts and locations of the Jobsite(s) from commencement of the Work through Final Completion. Contractor shall take whatever steps necessary to provide such access when requested.

2.8 Utilities

Contractor shall, at its expense, make all arrangements necessary to secure the availability of and maintain all temporary utilities required to construct and operate Contractor's Work as required by the Contract Documents. If the scope of Work requires, Contractor shall arrange for activating permanent power, water, and sanitary service to the Project prior to Substantial Completion. This includes legal sketches and descriptions for easement as well as record drawings requirements required by utility companies. The County will assume permanent utility costs at Substantial Completion.

2.9 Existing Utility Lines

2.9.1 When existing Utility Lines (e.g. conduits, pipelines, transmission mains and utility equipment and appurtenances) shown on the Drawings are to be removed or relocated, Contractor shall notify the Project Manager in ample time (but in no event less than five (5) business days) for taking measures for prevention of the interruption of any required services prior to the beginning of operations. Locations of existing utility lines shown on the Drawings are based on the best information available to the Project Manager, but shall not be considered exact either as to location or number of such lines.

2.9.2 Contractor shall protect Utility Lines constructed under terms of the Contract and those discovered or shown on Drawings to be existing. In the event that Contractor damages any existing Utility Lines, shown or not shown on the Drawings, Contractor shall immediately notify the Project Manager. Damage occurring to existing Utility Lines due to Contractor's failure to exercise reasonable care shall be repaired or replaced at no cost to the County.

2.10 Taxes

Contractor shall pay all taxes, levies, duties and assessments of every nature which may be applicable to any Work under this Contract. The Contract Price and any agreed variations thereof shall include all applicable taxes imposed by law. Contractor shall make any and all payroll deductions required by law. Contractor herein indemnifies and holds the County harmless from any liability on account of any and all such taxes, levies, duties, assessments and deductions. The indemnity provision of this section shall survive the expiration or earlier termination of this Contract. Contractor may not use County's tax-exempt status unless specifically authorized in writing in advance.

2.11 Publicity and Advertising

2.11.1 Contractor shall not make any announcement or release any information or publish any photographs concerning this Contract, the Work or the Project or any part thereof to any member of the public, press or any official body, unless prior written consent is obtained from the County.

2.11.2 Use of the County Seal or County Logo is strictly prohibited. In accordance with, County Ordinance 92-2 and County Administrative Policy 101.3, Contractor may not manufacture, use, display, or otherwise use any facsimile or reproduction of the County Seal or Logo without express written approval of the Board of County Commissioners of St. Johns County, Florida.

2.12 County Furnished Items

2.12.1 The County shall furnish to Contractor, at the time of executing this Contract, written and tangible material concerning conditions below ground at the Jobsite. Such written and tangible material is furnished to Contractor only in order to make disclosure of such material and for no other purpose. By furnishing such material, the County does not represent, warrant, or guarantee its accuracy either in whole, in part, implicitly, or at all, and shall have no liability therefore. The County shall also furnish surveys, legal limitations and utility locations (if known), and a legal description of the Project's Jobsite.

2.12.2 Contractor shall obtain and pay for all permits, fees and licenses necessary and ordinary for the performance of the Work. Excluding such permits, fees and licenses, the County shall obtain all approvals, easements, and the like required for construction.

2.12.3 Subject to Paragraph 1.6 above, the County shall furnish Contractor electronic copies of the Contract Documents for execution of the Work. Hard copies of the Contract Documents shall be the responsibility of Contractor. The above responsibility notwithstanding, Contractor may request a (hardcopy) set of Contract Documents from the County. Contractor will reimburse the County for the actual costs (or \$25, whichever is greater), of providing such hardcopy set.

ARTICLE III CONTRACT TIME

3.1 Schedule

3.1.1 Contractor shall commence the Work within ten (10) calendar days following receipt of the County's Notice to Proceed and shall substantially complete all Work within **three hundred (300)** consecutive calendar days as may be extended pursuant to Paragraph 8.2 of this Contract. Final Completion shall be reached by or before **thirty (30)** consecutive calendar days after Substantial Completion.

3.1.2 Contractor, prior to commencing the Work, shall submit to the Project Manager for his/her information, Contractor's schedule for completing the Work. Contractor's schedule shall be revised no less frequently than monthly (unless the parties otherwise agree in writing), and relate to the entire Work. By way of illustration and not exclusion, Contractor's schedule shall: (1) contain sufficient activities to assure adequate planning for the Work, (2) include approved changes to the Work that impact the schedule, (3) include a clearly defined critical path, and (4) include a unique description for each activity. In the event any schedule revision impacts the completion time as provided in Paragraph 3.1.1 above, Contractor shall submit a request for additional time, in accordance with procedures as provided in Paragraph 8.2 below. Failure by Contractor to strictly comply with the provisions of this Paragraph shall constitute a material breach of this Contract.

3.2 Time is of the Essence

Time is of the essence regarding each and every obligation of Contractor under this Contract. Each obligation is deemed material, and a breach of any such obligation (including a breach resulting from untimely performance) is a material breach.

3.3 Liquidated Damages

3.3.1 Execution of this Contract by Contractor shall constitute Contractor's acknowledgment that the County will sustain damages in the amount identified in Paragraph 3.3.2 below for each and every calendar day during which completion of the Work required is delayed beyond Final Completion. Contractor and County agree that such damages shall be presumed to be the damages actually sustained by the County as defined below, and that because of the nature of the Project, it would be impracticable or impossible to determine or extremely difficult to fix the actual damages.

3.3.2 If Contractor fails to achieve Substantial Completion or Final Completion of the Work by its applicable date, then the County shall be entitled to withhold from any amounts otherwise due Contractor or to be paid as a debt due the sum of **\$1,241.00** per day for each and every calendar day of unexcused delay "Liquidated Damages". The parties agree that such Liquidated Damages are not a penalty but rather a genuine pre-estimate of monetary damages sustained by the County for loss of revenue and/or increased project administration expenses related to this Contract because Contractor

failed to perform and complete Work within the time fixed for completion or additional time granted pursuant to the provisions hereof. The assessment of Liquidated Damages are without prejudice to the County's rights of termination and Contractor's obligation to complete the Work.

3.3.3 Should Contractor fall behind the approved Work schedule; the County reserves the right to deduct Liquidated Damages based on an estimated period of late completion. The County need not wait until completion of Work to withhold Liquidated Damages from Contractor's progress payments.

3.4 Disclaimer of Consequential Damages

The County shall not be liable to Contractor, whether in contract, tort, warranty or under any statute or on any other basis, for any consequential, incidental, indirect, special, punitive or exemplary damages suffered or incurred by Contractor in connection with this Contract, even if the County has been advised of the possibility of such damages. Consequential damages shall include, by way of example and without limitation, opportunity costs, loss of use of facilities or other assets, consequential damage claims of subcontractors, lost profits, lost savings, lost business, lost bonding capacity, lost financing, lost reputation or lost goodwill.

ARTICLE IV CONTRACT PRICE AND PAYMENT

4.1 Contract Price

4.1.1 This Contract is a LUMP SUM Contract. As compensation for satisfactory performance of the Work, the County shall compensate, and Contractor shall accept, as full and complete compensation for all the Work required herein a total Lump Sum price of **Four Hundred Fourteen Thousand Seven Hundred Dollars (\$414,700.00)**, the "Contract Price". The cost of any item of Work not covered by a specific Lump Sum shall be included in the Lump Sum price to which the item is most applicable.

4.1.2 If required by the County, Contractor shall have included unit prices in the base Lump Sum. Such unit prices shall apply to revisions to the Work as directed by the County in accordance with Article VIII. Unit prices are "all-inclusive", including labor, material, supervision, tools, equipment, insurance, taxes, fringe benefits, coordination, engineering, overhead, profit, performance and payment bonds, and all other things necessary. Unit prices are fixed for the duration of the Contract and are not subject to escalation for any cause.

4.2 Schedule of Values

4.2.1 Prior to the commencement of Work, Contractor shall submit to the County and to the Project Manager a Schedule of Values allocating the Contract Price to the various portions of the Work. Contractor's Schedule of Values shall be prepared in such form, with such detail, and supported by such data as the Project Manager or the County may require to substantiate its accuracy. Contractor shall not imbalance the Schedule of Values nor artificially inflate any element thereof. The violation of this provision by Contractor shall constitute a material breach of this Contract.

4.2.2 Upon approval by the County the Schedule of Values shall be used as a basis for Contractor's Application for Payment. The total of all payments in the Schedule of Values must at all times be equal to the Contract Price. No progress payment shall be made to Contractor until an acceptable Schedule of Values is submitted.

4.2.3 General conditions costs may be considered as a line item for the following items (break down required) (collectively the following shall be known as the General Conditions Costs):

- a) Contractor's field office personnel (full-time on-site)
- b) Construction office and storage facilities
- c) Utilities required to sustain field office and sanitary facilities
- d) Electrical power and water for construction
- e) Bonds and Insurance

4.2.4 Progress payments for general conditions costs will be based on the percentage of Work completed to date, except bonds and insurance which may be requested in full. Separate payments for Shop Drawings and deposits for materials will not be allowed.

4.3 Measurement and Payment

4.3.1 Contractor shall make all surveys necessary for determining all quantities of Work to be paid under this Contract. Copies of field notes, computations and other records made by Contractor for the purpose of determining quantities shall be furnished to the Project Manager upon request. Contractor shall notify the Project Manager prior to the time such surveys are made. The Project Manager may but shall have no obligation to witness and verify such surveys. Measurements and computations shall be made by such methods as the County may consider appropriate for the class of work measured. The dividing limits, lines or planes between adjacent items or classes of excavation, concrete, or other types of Work where not definitely indicated on the Drawings or in the Specifications shall be as determined by the County.

4.3.2 No payments of invoices (or portions thereof) shall, at any time, constitute approval or acceptance of the Work under this Contract, nor be a waiver by the County of any of the terms contained herein.

4.4 Progress Payments

4.4.1 Prior to Contractor's submittal of the initial Application for Payment, Contractor shall have delivered the following documents. The County will not make any payment to Contractor until Contractor has complied with these requirements.

- a) Schedule of Values
- b) Project Schedule
- c) Certified copy of recorded bond
- d) Insurance Certificates

4.4.2 On or before the tenth (10th) day of each calendar month, Contractor shall submit an Application for Payment to the Project Manager in such form and manner, and with such supporting data and content, as the Project Manager may require. Such Application for Payment shall be based on the amount of Work done or completed during the payment period which is defined as the first day of the preceding calendar month through the last day of the preceding calendar month. The Project Manager will review the Application for Payment to determine whether the quantity and quality of the Work is as represented in the Application for Payment and thereafter confirm to the County the amount properly owing to Contractor. Upon receipt by the County of the Project Manager's recommendation for payment, payments will be made in accordance with the Local Government Prompt Payment Act (Sections 218.70-218.80 of the Florida Statutes) less such amounts, if any, otherwise owing by Contractor to the County or which the County shall have the right to withhold. Any Application for Payment determined by the County not to be suitable for payment shall be modified and processed in accordance with the County's assessment.

4.4.3 In the event any dispute with respect to any payment or Application for Payment cannot be resolved between Contractor and the County's Project staff, Contractor may demand in writing a meeting with and review by the County's Assistant Director of Purchasing and Contracts. Such meeting and review shall occur within ten (10) business days of receipt by the County of Contractor's written demand. The Assistant Director of Purchasing and Contracts shall issue a written decision on the dispute within ten (10) business days of such meeting. This decision shall be deemed the County's final decision for the purpose of the Local Government Prompt Payment Act.

4.4.4 The County may withhold from each progress payment made to Contractor an amount not to exceed five (5%) percent of payment as retainage until final acceptance of all Work in accordance with Section 255.078 of the Florida Statutes. Any interest earned on retainage shall accrue to the benefit of the County. The County shall make prompt payment to Contractor, unless in accordance with Section 255.078(6) of the Florida Statutes, such funds are the subject of a good faith dispute, claim or demand by the County or Contractor.

4.4.5 Contractor warrants and guarantees that title to Work, materials, and equipment covered in any Application for Payment, whether incorporated in the Project or not, shall pass to the County no later than the time of payment and shall be free and clear of liens, claims, security interests or other encumbrances.

4.5 Application for Payment

4.5.1 Contractor may make Application for Payment, at intervals of not more than once a month for Work satisfactorily completed during the Project. Contractor shall submit with each Application for Payment an updated Project schedule acceptable to the Project Manager. Each Application for Payment shall clearly include:

- a) Contract Number;
- b) A unique Application for Payment number;
- c) Contractor's legal name and address;
- d) Taxpayer identification number (Contractor's federal employer identification number);
- e) Brief description of the completed Work, in accordance with Contractor's Schedule of Values;
- f) Original Contract Price including approved Change Order amounts; and,
- g) Preferred remittance address, if different from the mailing address.

The County may require any other information from Contractor that the County deems necessary to verify Contractor's Application for Payment. No later than ten (10) days after execution of this Contract or Notice to Proceed has been issued, the County will identify in a separate written notice the submittal requirements for Contractor's payment requests.

4.5.2 Delivered, stored or stockpiled materials may be included in an Application for Payment provided Contractor meets the following conditions:

- a) Materials are suitably and securely stored at the Jobsite or a bonded warehouse (acceptable to the County);
- b) An applicable purchase order or supplier's invoice is provided listing the materials in detail, cost of materials and identifying this specific Project by name; and
- c) The material is insured against loss or damage (from whatever source) or disappearance prior to incorporation into the Work.

Payments for such materials shall be at the sole discretion of the Project Manager, shall be based only upon the actual cost of the materials to Contractor, and shall not include any overhead or profit to Contractor.

4.5.3 Each Application for Payment shall be signed by Contractor and shall constitute Contractor's representation that the Work has progressed to the level for which payment is requested, that the Work has been properly installed or performed in full accordance with this Contract, and that Contractor knows of no reason why payment should not be made as requested. Contractor's final Application for Payment shall also be accompanied by a full and complete release and/or waiver of all liens complying with Section 713.20 of the Florida Statutes.

4.5.4 Contractor must remit undisputed payment due for labor, services, or materials furnished by Subcontractors and suppliers hired by Contractor, within ten (10) days after receipt of each progress payment from the County pursuant to Section 218.735 of the Florida Statutes. If necessary for the protection of the County, the County shall have the right, at its sole option, to make payment by joint check or by direct check to Contractor's Subcontractors or suppliers without advance notice to or consent of Contractor. If joint checks are issued following claims by Contractor's Subcontractors or suppliers, the County shall be entitled to an administrative fee of \$50.00 per check for the expense of processing each joint check. Any amounts paid directly to a Subcontractor or supplier will be deducted from payments made to, or amounts due or that may become due to, Contractor. The issuance of a joint check shall create no rights in favor of any person or entity beyond the right of the named payees to payment of the check and shall not be deemed to commit the County to repeat the procedure in the future.

4.5.5 No progress payment, nor any use or occupancy of the Project by the County, shall be interpreted to constitute approval or acceptance of any Work under this Contract, nor be considered a waiver by Contractor of any of the terms of this Contract.

4.5.6 The County's performance and obligation to pay under this Contract is contingent upon an appropriation of lawfully available funds by the Board of County Commissioners. The County shall promptly notify Contractor if the necessary appropriation is not made.

4.6 Withheld Payment

4.6.1 The County may decline to make payment, may withhold funds otherwise payable and, if necessary, may demand the return of some or all of the amounts previously paid to Contractor, if:

- a) Any Claims are made against Contractor by the County or third parties, including Claims for liquidated damages or if reasonable evidence indicates the probability of the making of any such Claim;
- b) Any Claims are made against the County, the County's property or any other party indemnified hereunder which is or might be covered by Contractors Indemnification obligations under Section 11.2 below;

- c) Contractor fails to pay Subcontractors or others in full and on-time;
- d) Contractor fails to submit schedules, reports, or other information required under the Contract;
- e) Contractor fails to diligently prosecute the Work and maintain progress to assure completion within the Contract Time;
- f) Contractor persistently fails to fully and timely perform the Work in accordance with the Contract Documents;
- g) Defective or nonconforming Work is not remedied; or
- h) Contractor is in default of any other representation, warranty, covenant or performance obligation of this Contract.

4.6.2 If Claims or liens filed against Contractor or property of the County connected with performance under this Contract are not promptly removed by Contractor after receipt of written notice from the County to do so, the County may remove such Claims or liens and all costs in connection with such removal shall be deducted from withheld payments or other monies due, or which may become due, to Contractor. If the amount of such withheld payments or other monies due Contractor under the Contract is insufficient to meet such cost, or if any Claim or lien against Contractor is discharged by the County after final payment is made, Contractor and its surety or sureties shall promptly pay the County all costs (including attorney's fees) incurred thereby regardless of when such Claim or lien arose.

ARTICLE V CONTRACTOR RESPONSIBILITIES

5.1 Performance

5.1.1 Contractor warrants that, to the best of its knowledge, there is no pending or threatened action, proceeding, or investigation, or any other legal or financial condition, that would in any way prohibit, restrain, or diminish Contractor's ability to satisfy its contractual obligations hereunder.

5.1.2 Contractor shall perform no part of the Work at any time without adequate Contract Documents or, as appropriate, approved Shop Drawings, Product Data or samples for such portion of the Work. If Contractor performs any portion of the Work where Contractor knows or should know such Work involves a recognized error, inconsistency or omission in the Contract Documents without notice to the Project Manager and the County, Contractor shall bear responsibility for such performance and shall bear the cost of correction.

5.1.3 Contractor shall perform the Work strictly in accordance with this Contract.

5.1.4 Contractor shall confine its operations to the Jobsite or such other land and areas identified in and permitted by the Contract Documents. Contractor shall assume full responsibility for any damage to any such land or area, to the County or occupant thereof, or of any adjacent land or areas, resulting from the performance of the Work. Should any Claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the Claim by other dispute resolution proceeding or at law. Contractor shall, to the fullest extent permitted by Applicable Law, indemnify and hold harmless the County, and its officers, directors, agents and employees and anyone directly or indirectly employed by them from and against Claims, costs, losses, and damages arising out of or resulting from any Claim or action, legal or equitable, brought by any such owner or occupant against the County or any other party indemnified hereunder to the extent caused by or based upon Contractor's or a Subcontractor's performance of the Work.

5.1.5 Contractor is solely and exclusively responsible for supervising all workers at the Jobsite. Contractor shall supervise and direct the Work using Contractor's best skill, effort and attention. Contractor shall be responsible to the County for any and all acts or omissions of Contractor, its employees and others engaged in the Work on behalf of Contractor.

5.1.6 Contractor and the Work must comply with all Applicable Law and the requirements of any applicable grant agreements.

5.2 Authorized Representative

5.2.1 Prior to commencing Work, Contractor shall designate in writing a competent, authorized representative(s) acceptable to the County to represent and act for Contractor ("Authorized Representative"). Absent such written designation, Contractor's Jobsite superintendent shall be deemed Contractor's Authorized Representative and s/he shall be authorized to receive and accept any and all communications from the County or the County's Project Manager. All communications given to the Authorized Representative shall be binding upon Contractor. An Authorized

Representative may be added, removed or changed upon prior written notice given pursuant to Section 13.18 titled "Written Notice".

5.2.2 At all times while performing the Work and Warranty Work, Contractor shall have one or more Authorized Representatives present on the Jobsite. Such Authorized Representative shall be capable to effectively communicate with the County or the County's Project Manager, execute and enforce applicable Contract Documents and address Jobsite safety and environmental requirements.

5.3 Environmental, Safety and Health

5.3.1 Safety and Protection. Contractor shall be solely and exclusively responsible for conducting operations under this Contract to avoid risk of harm to the health and safety of persons and property and for inspecting, supervising and monitoring all equipment, materials (whether in storage on or off the Jobsite), work practices and safety precautions (including but not limited to adequate maintenance of traffic) used in the Work to ensure compliance with its obligations under this Contract. Contractor shall provide or cause to be provided necessary training and furnish all safety construction equipment/tools, including OSHA compliant and ANSI certified personal protective equipment as appropriate and necessary for the performance of the Work, to its subcontractors of every tier and enforce the use of such training and safety construction equipment/tools.

5.3.2 Compliance. Contractor shall comply with all Applicable Laws bearing on the safety of persons or property, or their protection from damage, injury or loss including compliance with applicable permits, Project plans and approvals. To the extent allowed by law, Contractor shall assume all responsibility and liability with respect to all matters regarding the safety and health of its employees and the employees of Contractor's subcontractors and suppliers of any tier, with respect to the Work.

5.3.3 Stop Work Authority. Notwithstanding the foregoing, the County reserves the right to direct Contractor to stop Work and correct an unsafe condition at any time that any person present at the Jobsite identifies any unsafe condition or action. For this purpose only, any person at the Jobsite is authorized to act on behalf of the County.

5.3.4 Safety Representative. Prior to commencing Work, Contractor shall designate in writing a member(s) of its Jobsite construction team as its Safety Representative. Such Safety Representative shall be acceptable to the County and shall have responsibility for implementing all safety procedures, including OSHA, responsibility for the prevention of accidents, authority for monitoring safety of the Work, authority to correct unsafe conditions or acts by its employees or Subcontractors, the ability to oversee compliance with and address environmental requirements, and coordinate with other on-site contractors and subcontractors on safety and environmental matters required for the Work. In the absence of the required written designation, this person shall be Contractor's Superintendent.

5.3.5 Safety Reporting Requirements. Contractor shall maintain accident and injury records as required by Applicable Law. Such records will be made available to the County upon request. Contractor shall immediately report to the County any death, injury or damage to property incurred or caused by Contractor's employees and employees of Contractor's subcontractors and suppliers of any tier.

5.3.6 Drug Free Workplace. By signing this Contract, Contractor agrees to maintain a healthy and productive workforce and safe working conditions thru compliance with the Drug-Free Workplace Act (Chapter 112, Florida State Statutes). Contractor's personnel shall not possess, use, manufacture, distribute or be under the influence of while on the Jobsite (or any other location where the provisions of this Contract applies) alcoholic beverages and/or illegal drugs or any other "Drug" as such term is defined in the Drug-Free Workplace Act.

5.3.7 Occupational Safety and Health Act (OSHA). Contractor warrants that all materials, equipment, services, etc., delivered or provided to the County shall conform in all respects to the standards set forth in the Occupational Safety and Health Act (OSHA) of 1970 as amended and the failure to comply will be considered a breach of this Contract. Contractor further certifies that if material, equipment, service, etc., delivered or provided to the County is subsequently found to be deficient in any OSHA requirement in effect on date of delivery or service fulfillment date, all costs necessary to bring the material, equipment, service, etc., into compliance with the aforementioned requirements shall be borne by Contractor.

5.3.8 Toxic Substances/Federal Hazard Communication "Right to Know and Understand" Regulations
The Federal "Right to Know and Understand" Regulation (also known as the Hazard Communication / Globally

Harmonized System of Classification and Labeling of Chemicals (GHS) implemented by OSHA requires employers to inform their employees of any toxic substances to which they may be exposed in the workplace, and to provide training in safe chemical storage, labeling, handling practices and emergency procedures.

Accordingly, Contractor is required to provide completed Safety Data Sheets (SDS) for each hazardous substance provided to the County under this Contract. This includes hazardous substances that are not directly included in the Contract Documents, but are included in the goods or services provided by Contractor to the County. The SDS for each substance must be sent to the County's Project Manager and must also be sent to:

St. Johns County, a political subdivision of the State of Florida
500 San Sebastian View
St. Augustine, FL 32084
Attn: Risk Management

In the event that hazardous material is improperly handled or stored by Contractor, its subcontractors, any sub-subcontractors, or any employee or agent of any of the aforementioned which results in contamination of the Jobsite, Contractor shall immediately notify the County and the appropriate governmental authority and shall take whatever action is necessary or desirable to remediate the contamination at Contractor's sole cost and expense. Further, Contractor shall indemnify and hold harmless the County from any and all cost, expense, action, or liability whatsoever resulting from such contamination and/or remedial activities. The indemnity provisions of this section shall survive the expiration or earlier termination of this Contract.

5.4 Substantial Completion

5.4.1 When Contractor considers the Work is substantially complete, Contractor shall notify the Project Manager in writing and submit a comprehensive list of incomplete items to be completed or corrected prior to Final Completion. The Project Manager will promptly inspect the Work following receipt of Contractor's notice and attached list of incomplete items. The Project Manager may refuse to inspect the Work if the Work is obviously not substantially complete or when Contractor's list is not complete.

5.4.2 To the extent applicable to Contractor's specific Work scope, the following items shall be completed prior to Contractor's request for a Substantial Completion inspection.

- a) All general construction completed.
- b) Project Jobsite cleared of Contractor's excess equipment, storage shacks, trailers, and/or building supplies.
- c) Project record Drawings and Specifications submitted in accordance with the Contract Documents.
- d) Preliminary as-built drawings submitted.
- e) All applicable permits required for use provided.
- g) All operations and maintenance manuals, training literature, and software for all equipment provided.
- h) Manufacturers' certifications and warranties provided.
- i) All required spare parts and special tools provided.

5.4.3 If Substantial Completion is not obtained at the inspection called by Contractor, for reasons which are the fault of Contractor, the cost of any subsequent inspections requested by Contractor for the purpose of determining Substantial Completion shall be the responsibility of Contractor and shall be assessed against the final payment application.

5.4.4 Once Substantial Completion is achieved and within the time allowed by F.S. 218.70 et seq, the Project Manager will prepare the punch list required by the Local Government Prompt Payment Act. Unless otherwise mutually agreed, the punch list items shall be corrected by Contractor within thirty (30) calendar days and prior to any request for Final Inspection and Acceptance. The failure to include any corrective Work or pending items not yet completed on the list does not alter the responsibility of Contractor to complete the Work pursuant to this Contract.

5.5 Final Inspection

When all the Work is finally complete and Contractor is ready for a final inspection, Contractor shall provide written notice to the County and the Project Manager. The Project Manager, with Contractor's cooperation, will conduct such reviews, inspections and tests as may be reasonably required to satisfy the County that the Work, or identified portion of the Work, conforms to all requirements of the Contract Documents. If the Project Manager determines that the Work or any part of the Work is not complete or fails to conform to the Contract Document requirements, Contractor will be

notified in writing of deficiencies. After correcting all deficiencies Contractor shall again initiate the procedures for final inspection as set forth above. The Project Manager will issue a Final Certificate for Payment following satisfactory inspection of the Work provided Contractor has delivered to the Project Manager the final corrected as-built Drawings and the final bill of materials, if any.

5.6 Final Payment

5.6.1 Upon Contractor's receipt of the Final Certificate for Payment, Contractor may submit a final invoice provided the following has been completed or submitted with such final invoice:

- a) Complete all items applicable to the Work identified in Paragraph 5.4.2;
- b) Complete all Work listed on the punch list prepared in accordance with Paragraph 5.4.4;
- c) Consent of Surety for final payment and/or retainage;
- d) Final Waiver and Release of Claim signed by Contractor;
- e) Submittal of final corrected as-built (record) Drawings;
- f) Settlement of Liquidated Damages, as applicable; and
- g) Settlement of liens and Claims, if any.

5.6.2 Acceptance of Final Payment shall constitute a waiver of all Claims against the County by Contractor except for those Claims previously made in writing against the County by Contractor, pending at the time of Final Payment, and identified in writing by Contractor as unsettled at the time of its request for Final Payment.

5.6.3 In the event Contractor fails to make a Request for Final Payment, or to resubmit a final Application for Payment within ninety (90) days after being requested to do so, the County may deem any and all retained funds to be abandoned property and shall give notice of abandonment to Contractor. The County may set off against the final payment any amounts due to County from Contractor arising out of or under this or any other Contract or Contract between them.

ARTICLE VI PROJECT MANAGER

6.1 Project Manager Responsibilities

6.1.1 The County shall designate as its representative a Project Manager who shall be fully acquainted with the Project. The Project Manager shall be the County's representative from the Effective Date of this Contract until final payment has been made. The Project Manager shall be authorized to act on behalf of the County only to the extent provided in this Article VI.

6.1.2 The County and Contractor shall communicate with each other in the first instance through the Project Manager.

6.1.3 The Project Manager shall be the initial interpreter of the requirements of the Drawings and Specifications and the judge of the performance there under by Contractor. The Project Manager shall render written or graphic interpretations necessary for the proper execution or progress of the Work with reasonable promptness on request of Contractor.

6.1.4 The Project Manager shall review Contractor's Applications for Payment and shall confirm to the County for payment to Contractor, those amounts then due to Contractor as provided in this Contract.

6.1.5 The Project Manager shall have authority to reject Work, which is defective or does not conform to the requirements of this Contract. If the Project Manager deems it necessary or advisable, the Project Manager shall have authority to require additional inspection or testing of the Work for compliance with Contract requirements at Contractor's expense.

6.1.6 The Project Manager shall review and accept, or take other appropriate action as necessary, concerning Contractor's submittals including but not limited to Shop Drawings, Product Data and Samples. Such review, acceptance or other action shall be for the sole purpose of determining conformance with the design concept and information given through the Contract Documents.

6.1.7 The Project Manager may authorize minor changes in the Work by field order as provided elsewhere herein. The Project Manager does not have authority to approve adjustments to the Contract Price or Contract Time. If at any time Contractor believes that acts or omissions of the County constitute a change to the Work, Contractor shall submit a

written notice in accordance with the requirements of Article VIII.

6.1.8 The Project Manager shall, upon written request from Contractor, conduct inspections to determine the date of Substantial Completion and the date of Final Completion, shall receive and forward to the County for the County's review and records, written warranties and related documents required by this Contract and shall issue a Final Certificate for Payment upon compliance with the requirements of this Contract.

6.1.9 The Project Manager's decision in matters relating to aesthetic effect shall be final if consistent with the intent of this Contract.

6.2 Field Orders

The Project Manager shall have authority to order minor changes in the Work not involving a change in the Contract Price or Contract Time and not inconsistent with the intent of this Contract. Such changes shall be effected by written field order and shall be binding upon Contractor. Contractor shall carry out such field orders promptly.

ARTICLE VII SUBCONTRACTORS

7.1 Award of Subcontracts

7.1.1 Contractor shall be responsible for all Work performed under the Contract Documents. All persons engaged in the Work of the Project are the responsibility and under the control of Contractor. Contractor shall furnish the Project Manager, in writing, the names of persons or entities proposed by Contractor to act as a Subcontractor on the Project. The Project Manager shall promptly reply to Contractor, in writing, stating any objections the Project Manager may have to such proposed Subcontractor. Contractor shall not enter into a Subcontract with a proposed Subcontractor with reference to whom the Project Manager has made a timely objection.

7.1.2 Contractor shall give personal attention to fulfillment of the Contract and shall keep the Work under Contractor's control. When any Subcontractor fails to execute a portion of the Work in a manner satisfactory to the County, Contractor shall remove such Subcontractor immediately upon written request from the County, and the Subcontractor shall not again be employed on the Project. The County will not entertain requests to arbitrate disputes among Subcontractors or between Contractor and Subcontractor(s) concerning responsibility for performing any part of the Work.

ARTICLE VIII CHANGES IN THE WORK

8.1 General

8.1.1 The County may, at any time, without invalidating this Contract and without notice to sureties, direct changes in the Work within the general scope of this Contract, consisting of additions, deletions, revisions, or any combination thereof, by Change Order or by field order. Contractor agrees to promptly comply with such orders and proceed with the Work, which shall be performed under the applicable requirements of the Contract Documents. Contract Time and Contract Price will be adjusted, in accordance with Sections 8.2 and 8.3 below, by written Change Order for changes which materially increase or decrease the cost of or time for performance of the Work.

8.1.2 If at any time Contractor believes that acts or omissions of the County constitute a change to the Work, Contractor shall submit a written notice to the Project Manager explaining in detail the basis for the change request. Contractor's written notice must be furnished within five (5) days of the commencement of the event giving rise to the claim or Contractor's knowledge of the claim, and the notice shall state the general nature and cause of the claim. Thereafter, within twenty (20) days after the termination of the event giving rise to the claim or Contractor's knowledge of the claim, Contractor shall submit written notice of the extent of the claim with supporting information and documentation to the Project Manager and County. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT TIME OR CONTRACT PRICE SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.** Pending final resolution of any such claim request, Contractor shall diligently proceed with performance of this Contract regardless of any dispute concerning performance of the Work or the amount Contractor is to be paid for such Work.

8.2 Changes in the Contract Time

8.2.1 The Contract Time will be extended by Change Order in an amount equal to time lost on critical Work items

due to delays beyond the control of and through no fault or negligence of Contractor if a claim for an extension is submitted in accordance with Section 8.1.2 above.

8.2.2 If Contractor is delayed in progressing any task which at the time of the delay is then critical or which during the delay becomes critical, as a direct result of unusually adverse weather conditions not reasonably anticipated, or any other causes beyond Contractor's reasonable control and not attributable to Contractor or Contractor's Subcontractor's actions or failure to act, then the date for achieving Substantial Completion of the Work may be extended for such reasonable time as the Project Manager may determine. An extension of Contract Time shall be Contractor's sole and exclusive remedy for delay unless the delay is solely caused by fraud, bad faith or active interference on the part of the County or its representatives. In no event shall Contractor be compensated for interim delays that do not extend the Contract Time.

8.2.3 Extensions to the Contract Time for delays caused by the effects of inclement weather shall be submitted as a request for a change in the Contract Time pursuant to paragraph 8.1.2 above. Time extensions are justified only when rain, other inclement weather conditions, or related adverse soil conditions result in Contractor's inability to work at least fifty percent (50%) of the normal workday on controlling items of Work identified on the accepted schedule or updates to that schedule.

8.2.4 Contractor shall, at no cost to the County, take all precautions necessary to secure the Project Jobsite from any damage that may be caused by all threatened storm events, regardless of whether the County has given notice of same. Compliance with any specific storm event precautions will not constitute additional work. Suspension of the Work caused by a threatened or actual storm event, regardless of whether the County has directed such suspension, will entitle Contractor to additional Contract Time only and shall not give rise to a claim for a change in the Contract Price.

8.3 Changes in the Contract Price

8.3.1 In connection with any claim by Contractor against the County for compensation in excess of the Contract Price, any liability of the County for Contractor's costs shall be strictly limited to direct costs incurred by Contractor and shall in no event include indirect costs or consequential damages of Contractor.

8.3.2 Any change in the Contract Price resulting from a Change Order shall be determined as follows:

- a) By mutual acceptance of a lump sum increase or decrease in costs. Upon the Project Manager's request, Contractor shall furnish a detailed estimate of increased or decreased costs, together with cost breakdowns and other support data as the Project Manager may reasonably request.
- b) By Unit Prices stated in the Contract Documents, or subsequently agreed upon payment.
- c) By a manner or method mutually agreed by the County and Contractor.

8.3.3 If no mutual agreement occurs between the County and Contractor, then the change in the Contract Price, if any, shall than be determined by the Project Manager on the basis of the reasonable expenditures or savings of those performing, deleting or revising the Work attributable to the change, including, in the case of an increase or decrease in the Contract Price, a reasonable allowance for direct job site overhead and profit. In such case, Contractor shall present, in such form and with such content as the County or the Project Manager requires, an itemized accounting of such expenditures or savings shall be limited to the following: reasonable costs of materials, supplies, or equipment including delivery costs, reasonable costs of labor, including social security, unemployment insurance, fringe benefits required by a pre-existing Contract or by custom, and workers' compensation insurance, reasonable costs of premiums for all bonds and insurance, permit fees, and sales, use or other taxes paid by Contractor that are directly attributable to the changed Work. In no event shall any expenditure or savings associated with Contractor's home office or other non-Jobsite overhead expenses be included in any change in the Contract Price. Pending final determination of reasonable expenditures or savings to the County, payments shall be made to Contractor based on the Project Manager's recommendation for payment.

8.3.4 Costs which will not be allowed or paid in Change Orders or other claims under this Contract include, but are not limited to, the costs of preparing or reviewing change request/claims or proposed Change Orders, change request/claim consulting costs; lost revenues; lost profits; lost income or earnings; interest cost of any type other than those mandated by statute; rescheduling costs; lost earnings; loss of other business; or the costs of Contractor representatives visiting the Jobsite or participating in meetings with the County. The County shall not be liable to Contractor for claims of third parties, including Subcontractors, unless and until liability of Contractor has been established therefore in a court of competent jurisdiction.

8.4 Acceptance of Change Orders

Contractor's written acceptance of a Change Order shall constitute a final and binding Contract to the provisions thereof and a waiver of all claims in connection therewith, whether direct, indirect, or consequential in nature.

8.5 Notice to Sureties

Contractor shall notify and obtain the timely consent and approval of Contractor's surety with reference to all Change Orders if such notice, consent or approval is required by Contractor's surety or by law. Contractor represents and warrants to County that Contractor is solely liable and responsible to so notify and obtain any such consent or approval.

8.6 Differing Site Conditions

If during the course of the Work, Contractor encounters (1) subsurface or concealed conditions at the Project's Jobsite that differ materially from those shown in the Contract Documents and from those ordinarily encountered and generally recognized as inherent in work of the character called for in this Contract; or (2) unknown physical conditions of the Project's Jobsite, of an unusual nature, which differ materially from that ordinarily encountered and generally recognized as inherent in work of the character called for in this Contract, then Contractor, without disturbing the conditions and before performing any Work affected by such conditions, shall, within twenty-four (24) hours of their discovery, notify the Project Manager in writing of the existence of the aforesaid conditions. The Project Manager shall, within two (2) business days after receipt of Contractor's written notice, investigate the site conditions identified by Contractor. If, in the sole opinion of the Project Manager, the conditions do materially so differ and cause an increase or decrease in Contractor's cost of, or the time required for, the performance of any part of the Work, whether or not charged as a result of the conditions, the Project Manager may recommend an equitable adjustment to the Contract Price, or the Contract Time, or both. If Project Manager and Contractor cannot agree on an adjustment in the Contract Price or Contract Time, the adjustment shall be referred to the Assistant Director of Purchasing and Contracts for determination in accordance with the provisions of Paragraph 1.5. No request by Contractor for an equitable adjustment to this Contract under this provision shall be allowed unless Contractor has given written notice to the Project Manager in strict accordance with the provisions of this Article. **No request for an equitable adjustment or change to the Contract Price or Contract Time for differing site conditions shall be allowed if made after the date certified by the Project Manager as the date of Substantial Completion.**

The failure by Contractor to provide written notice as provided in this Paragraph 8.6 shall constitute a waiver by Contractor of any Claim arising out of or relating to such concealed or unknown condition.

ARTICLE IX UNCOVERING WORK, STOPPING WORK, AND ACCEPTING DEFECTIVE OR NONCONFORMING WORK

9.1 Uncovering Work

9.1.1 No Work or portion of Work shall be covered until inspected by the County as required by the Contract Documents. If any of the Work is covered contrary to the request or direction of the County or the Project Manager or contrary to the requirements of the Contract Documents, Contractor shall, upon written request, uncover it for the Project Manager's inspection and subsequently cover the Work in accordance with the Contract Documents without adjustment to the Contract Time or Contract Price. The provisions and obligations set forth herein shall apply even if the County ultimately determines (after uncovering and inspection) that the underlying Work in question conforms to the requirements of the Contract Documents.

9.1.2 Should the County wish to either (i) re-inspect a portion of the Work that has been covered by Contractor in compliance with Paragraph 9.1.1, above, or (ii) inspect a portion of the Work that has been covered by Contractor which is not required by the Contract Documents to be observed or inspected prior to its being covered and which the County did not specifically request to observe prior to its being covered, Contractor shall uncover the applicable portion of the Work upon written request. If the County determines that the Work uncovered conforms to the requirements of the Contract Documents, then the County will pay the costs of uncovering and replacement of the cover through a Change Order and will adjust the Contract Time by Change Order if the uncovering and replacement Work extends the most current Substantial Completion or Final Completion date, as applicable. If, however, the County determines that the Work uncovered does not conform to the requirements of the Contract Documents, then Contractor shall pay the costs of uncovering and replacement and shall not be entitled to an adjustment of the Contract Price.

9.2 Right to Stop Work

If the Work is defective, or Contractor fails to supply sufficient skilled workers, 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, the County, acting through the Project Manager, may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. The County's right to stop Work, or any portion thereof, shall not give rise to any duty on the part of the County to exercise this right for the benefit of Contractor or any other party.

9.3 County May Accept Defective or Nonconforming Work

If the County chooses to accept defective or nonconforming Work, the County may do so. In such events, the Contract Price shall be reduced by the greater of (a) the reasonable cost of removing and correcting the defective or nonconforming Work, and (b) the difference between the fair market value of the Work had it not been constructed in such manner as to include defective or nonconforming Work. If the remaining portion of the unpaid Contract Price, if any, is insufficient to compensate the County for its acceptance of defective or nonconforming Work, Contractor shall, pay the County such remaining compensation for accepting defective or nonconforming Work.

ARTICLE X CONTRACT SUSPENSION AND TERMINATION

10.1 Suspension

The County may, by written notice, order Contractor to suspend, delay or interrupt Work, in whole or in part, for a period of time as the County may determine. If such suspension delays Contractor's ability to meet the authorized Contract Time, Contractor will be granted an extension of time as reasonably agreed by both parties. Contractor shall not be entitled to an adjustment to the Contract Time to the extent that performance is, was or would have been so suspended, delayed or interrupted by another cause, act or omission for which Contractor is responsible. Notwithstanding anything to the contrary in this Contract and, in the event any such suspension exceeds ninety (90) days, Contractor may, upon ten (10) days written notice to the County, terminate performance under this Contract and recover from the County an equitable adjustment in accordance with Section 8.3 above.

10.2 Termination

10.2.1 The County may by written notice to Contractor terminate the Work under this Contract in whole or in part at any time for the County's convenience or for the default of Contractor.

10.2.2 Upon receipt of such termination notice Contractor shall immediately stop all Work and shall immediately cause any and all of its Subcontractors and material suppliers at any tier, to immediately stop all work, leaving the construction Site in a safe and secured condition. Contractor shall not be paid for any work performed or costs incurred after the termination date that reasonably could have been avoided. The County may direct Contractor to assign Contractor's right, title and interest under terminated orders or subcontracts to its designee.

10.2.3 Contractor shall not remove from the construction Jobsite any materials, equipment, plant or tools that have been paid for by County pursuant to this Contract. Contractor hereby grants the County a free and unimpeded right of access to Contractor's facilities, which shall survive any termination of the Contract, for the purpose of permitting the County to take control of and remove any Work, including but not limited to any Work for which title has vested in the County.

10.2.4 If the termination is for the convenience of the County, an equitable adjustment in the compensation to be paid Contractor shall be made based upon the cost for completed Work, Work in progress, and the substantiated, reasonable and actually incurred costs associated with termination. No amount shall be allowed for anticipated profit or unperformed work.

10.2.5 For purposes of this Termination provision, Contractor shall be deemed in default if Contractor (1) persistently or repeatedly refuses or fails to perform the Work in a timely manner, (2) fails to supply enough properly skilled Workers, supervisory personnel or proper equipment or materials, (3) fails to make prompt payment to Subcontractors, or for materials or labor, (4) becomes insolvent or becomes the subject of voluntary or involuntary bankruptcy proceedings, (5) persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or (6) breaches or violates a material provision of this Contract. If the termination is attributable to the default of Contractor, the County shall have the right, without prejudice to any other right or remedy, to take possession of the construction Jobsite and of all materials, equipment, tools, construction equipment and machinery thereon owned by Contractor and may finish the Work by whatever methods it may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the Work is finished.

10.2.6 If the unpaid balance of the Contract Price less any liquidated damages due under this Contract, exceeds the cost of finishing the Work, including compensation for the Project Manager's additional services and expenses made necessary thereby, Contractor shall pay the difference to the County. This obligation for payment shall survive the termination of the Contract.

10.2.7 If, after termination by the County for Contractor's default, it is determined by a Court of competent jurisdiction that Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties, including adjustment of the Contract Price, will be the same as if the termination had been issued for the convenience of the County, as provided under Paragraph 10.2.4 above.

ARTICLE XI WARRANTY AND INDEMNITY

11.1 Warranty

11.1.1 Contractor warrants and guarantees to the County that all labor furnished to progress the Work under this Contract shall be competent to perform the tasks undertaken and that the product of such labor shall yield only first-class results and that all materials and equipment furnished under this Contract shall be of good quality, free from faults and defects and in strict conformance with the Contract Documents.

11.1.2 Contractor warrants all materials, equipment and labor it furnishes or performs under this Contract against all defects in design, materials and workmanship for a period of one year (or the period of time in any guarantee or warranty provided by any manufacturer or supplier of equipment or materials incorporated into the Work, whichever is later) from and after the date of Final Completion. Contractor shall within ten (10) Days after being notified in writing by the County of any defect in the Work or non-conformance of the Work (Warranty Work), commence and prosecute with due diligence all Work necessary to fulfill the terms of the warranty at its sole cost and expense. Contractor shall act sooner as requested by the County in response to an emergency. In addition, Contractor shall, at its sole cost and expense, repair and replace any portions of the Work (or work of other contractors) damaged by its Warranty Work or which becomes damaged in the course of repairing or replacing Warranty Work. For any Work so corrected, Contractor's obligation hereunder to correct Warranty Work shall be reinstated for an additional one-year period, commencing with the date of acceptance of such corrected Work.

11.1.3 Contractor shall perform such tests as the County may require to verify that any corrective actions, including, without limitation, redesign, repairs, and replacements comply with the requirements of the Contract Documents. All costs associated with such corrective actions and testing, including the removal, replacement, and reinstatement of equipment and materials necessary to gain access, shall be the sole responsibility of Contractor.

11.1.4 All warranties and guarantees of subcontractors, suppliers and manufacturers with respect to any portion of the Work, whether express or implied, are deemed to be obtained by Contractor for the benefit of the County, regardless of whether or not such warranties and guarantees have been transferred or assigned to the County by separate Contract and Contractor agrees to enforce such warranties and guarantees, if necessary, on behalf of the County.

11.1.5 In the event that Contractor fails to perform its obligations under this Warranty Section, or under any other warranty or guaranty under this Contract, to the reasonable satisfaction of the County, the County shall have the right to correct and replace any defective or non-conforming Work and any work damaged by such work or the replacement or correction thereof at Contractor's sole expense. Contractor shall be obligated to fully reimburse the County for any expenses incurred hereunder upon demand.

11.1.6 Failure on the part of the County to reject defective, non-conforming or unauthorized Work shall not release Contractor from its contractual obligations, be construed to mean acceptance of such Work or material by the County, or, after Final Completion, bar the County from recovering damages or obtaining such other remedies as may be permitted by law.

11.1.7 No adjustment in the Contract Time or Contract Price will be allowed because of delays in the performance of the Work as a result of correcting defective, non-conforming or unauthorized Work.

11.1.8 County and Contractor agree that the provisions of Florida Statute Chapter 558 shall not apply to this Contract.

11.2 Indemnity

11.2.1 Contractor shall indemnify and hold harmless the County and its officers and employees (“Indemnified Party”), from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney’s fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of Contractor and persons employed or utilized by Contractor in the performance of this Contract.

11.2.2 To the extent permitted by, and in accordance with Section 725.06 of the Florida Statutes, Contractor further agrees that “damages, losses and costs”, includes fines, citations, court judgments, insurance claims, restoration costs or other liability, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of Contractor and persons employed or utilized by Contractor in the performance of this Contract.

11.2.3 To the extent permitted by, and in accordance with Section 725.06 of the Florida Statutes, for purposes of indemnity, the “persons employed or utilized by Contractor” shall be construed to include, but not be limited to, Contractor, its staff, employees, subcontractors, all deliverers, suppliers, furnishers of materials or services or anyone acting for, on behalf of, or at the request of Contractor.

11.2.4 In Claims against any person or entity indemnified hereunder by an employee of Contractor, any Subcontractor, or subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section 11.2 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any Subcontractor or subcontractor under any workers’ compensation acts, disability benefits acts or other employee benefit acts.

11.2.5 Contractor’s indemnity and hold harmless obligations hereunder shall extend to all Claims against the County by any third party or third-party beneficiary of this Contract and all liabilities, damages, losses and costs related thereto.

11.2.6 This indemnification will not be valid in the instance where the loss is caused by the gross negligence, or willful, wanton or intentional misconduct of any Indemnified Party.

11.2.7 If any provision(s), or portion(s) of a provision(s) of this Section, or the application thereof to any person or circumstance shall, to any extent, be held to be invalid, illegal or unenforceable for any reason whatsoever, the validity, legality and enforceability of the remaining provision(s), or part of the provision(s), shall not in any way be affected or impaired thereby; and shall be interpreted to the fullest extent possible to be enforceable and to give effect to the intent manifested by the provision(s), or portion(s) thereof, held invalid, illegal or unenforceable.

11.2.8 Contractor shall further indemnify and hold harmless the County its officers and employees from and against all Claims arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents and shall defend such Claims in connection with any alleged infringement of such rights.

11.2.9 The indemnification provisions of this Section 11.2 shall survive expiration or earlier termination of this Contract.

ARTICLE XII INSURANCE AND BONDS

12.1 Contractor’s Insurance Requirements

12.1.1 All insurance policies shall be satisfactory to the County and be issued by companies authorized and duly licensed to transact business in the State of Florida. Contractor shall furnish proof of insurance to the County prior to execution of this Contract. No Work shall commence under this Contract until Contractor has obtained all insurance coverages required under this section. Certificates of insurance shall clearly indicate Contractor has obtained insurance of the type, amount, and classification as required by this Contract. Required insurance coverage shall be maintained in force, including coverage for Additional Insureds, until Final Completion of all Work including Warranty Work.

12.1.2 No less than ten (10) days written notice shall be provided to the County prior to cancellation, non-renewal or any material change of required insurance policies. Yearly renewal certificates shall be provided to the County within thirty (30) days of expiration of the current policy.

12.1.3 The types and amounts of insurance required under this Contract do not in any way limit the liability of

Contractor including under any warranty or indemnity provision of this Contract or any other obligation whatsoever Contractor may have to the County or others. Nothing in this Contract limits Contractor to the minimum required insurance coverages found in this Article XII.

12.2 Additional Insured Endorsements and Certificate Holder

The term "Additional Insured", as used in this Contract, shall mean St. John's County, its elected officials, officers, employees, agents and representatives. Certificates of insurance shall specifically name each Additional Insured for all policies of insurance except Workers' Compensation and Professional Liability. A copy of the endorsement showing the required coverages must accompany the certificate of insurance.

Certificate Holder Address: St. Johns County, a political subdivision of the State of Florida
500 San Sebastian View
St. Augustine, FL 32084
Attn: Purchasing Division

12.3 Workers Compensation

Contractor shall procure and maintain during the life of this Contract, adequate Workers' Compensation Insurance in at least such amounts as is required by law for all of its employees per Florida Statute 440.02.

12.4 Commercial General Liability

Contractor shall procure and maintain during the life of this Contract, Comprehensive General Liability Insurance with minimum limits of \$1,000,000 per occurrence, \$2,000,000 aggregate, including bodily injury (including wrongful death), property damage, products, personal & advertising injury, and completed operations. This insurance must provide coverage for all Claims that may arise from the services and/or operations completed under this Contract, whether such services or operations are by Contractor or anyone directly or indirectly employed by them. Such insurance(s) shall also be primary and non-contributory with regard to insurance carried by the Additional Insureds.

12.5 Automobile Liability

Contractor shall procure and maintain during the life of this Contract, Comprehensive Automobile Liability Insurance with minimum limits of \$300,000 combined single limit for bodily injury and property damage liability and insuring liability arising out of or in any way related directly or indirectly to the ownership, maintenance or use of any owned, non-owned or rented/hired automobiles.

12.6 Additional Coverages

ONLY THE SUBSECTIONS CORRESPONDING TO ANY CHECKED BOX IN THIS PARAGRAPH 12.6 WILL APPLY TO THIS CONTRACT.

12.6.1 Professional Liability.

12.6.1.1 Contractor shall procure and maintain, during the life of this Contract, Professional Liability or Errors and Omissions Insurance with minimum limits of \$1,000,000 with 10-year tail coverage starting upon Final Completion. Contractor's professional liability policy should not have an exclusion for environmental compliance management or construction management professionals.

12.16.1.2 In the event that Contractor employs professional engineering or land surveyor services for performing field engineering or preparing design calculations, plans, and specifications, Contractor shall require the retained engineers and land surveyors to carry professional liability insurance with limits not less than \$1,000,000 each claim with respect to negligent acts, errors, or omissions in connection with professional services to be provided under this Contract.

12.6.2 Builders Risk.

12.6.2.1 Contractor shall procure and maintain Builder's Risk ("all risk") insurance on a replacement cost basis. The amount of coverage shall be equal to the full replacement cost on a completed value basis, including periodic increases or decreases in values through change orders.

12.6.2.2 The Builder's Risk policy shall identify the County as the sole loss payee. The policy shall name as insured the County, Contractor and its subcontractors of every tier. Each insured shall waive all rights of subrogation against each of the other insured to the extent that the loss is covered by the Builder's Risk Insurance. The Builder's Risk policy

shall be primary and any self-insurance maintained by the County in not contributory. The Builder's Risk policy shall not include a co-insurance clause. This coverage shall not be lapsed or cancelled because of partial occupancy by the County prior to Final Completion of the Work.

12.6.2.3 The Builder's Risk insurance shall:

- a. insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal including demolition as may be reasonably necessary; and water damage (other than that caused by flood).
- b. cover, as insured property, at least the following: (i) the Work and all appurtenances, materials, supplies, fixtures, machinery, apparatus, equipment and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work including County furnished or assigned property; (ii) spare parts inventory required within the scope of the Contract; and (iii) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Jobsite, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
- c. extend to cover damage or loss to insured property (i) while in transit; and (ii) while in temporary storage at the Jobsite or in a storage location outside the Jobsite (but not including property stored at the premises of a manufacturer or supplier).
- d. include (i) performance/start-up and hot testing; (ii) soft costs (e.g. design and engineering fees, code updates, permits, bonds, insurances, and inspection costs); and (iii) costs of funding or financing when a covered risk causes delay in completing the Work.

12.6.3 The Builder's Risk Insurance may have a deductible clause. Contractor shall be responsible for paying any and all deductible costs. Notwithstanding anything to the contrary set forth above, the deductible for coverage of all perils and causes of loss enumerated in subparagraph 12.6.2.3 above shall not exceed \$250,000.

12.7 Other Requirements

The required insurance limits identified in Sections 12.4, 12.5, and 12.6 above may be satisfied by a combination of a primary policy and/or Umbrella or Excess Liability Insurance policy. Contractor shall require each lower-tier subcontractor to comply with all insurance requirements appropriate for its scope of work, and any deficiency shall not relieve Contractor of its responsibility herein. Upon written request, Contractor shall provide County with copies of lower-tier subcontractor certificates of insurance.

Providing and maintaining adequate insurance coverage is a material obligation of Contractor. County has no obligation or duty to advise Contractor of any non-compliance with the insurance requirements contained in this Section. If Contractor fails to obtain and maintain all of the insurance coverages required herein, Contractor shall indemnify and hold harmless the Additional Insureds from and against any and all Claims that would have been covered by such insurance had Contractor complied with its obligations herein.

County reserves the right to adjust the above minimum insurance requirements or require additional insurance coverages to address other insurable hazards.

12.8 Payment and Performance Bonds

Contractor shall execute, furnish the County with, and record in the public records of St. John's County, a Payment and Performance Bond in accordance with the provisions of Sections 255.05 and 287.0935 Florida Statutes, in an amount no less than the Contract Price. Such Payment and Performance Bond shall be conditioned upon the successful completion of all work, labor, services, equipment and materials to be provided and furnished hereunder, and the payment of all subcontractors, materialmen, and laborers. Said bond shall be subject to the approval of the Board of County Commissioners of St. John's County, Florida. In accordance with Section 255.05, F.S., the County may not make a payment to Contractor until Contractor has provided the County a certified copy of the recorded bond.

ARTICLE XIII MISCELLANEOUS

13.1 Examination of Contractor's Records

The County or its authorized representative shall, until the expiration of five (5) years after final payment under this Contract, have access to, and the right to examine any directly pertinent books, documents, papers and records of Contractor involving transactions relating to this Contract, and to make copies, excerpts and transcriptions thereof. If any such examination reveals that Contractor has overstated any component of the Contract Price, Change Order, Claim, or any other County payment obligation arising out of this Contract, then Contractor shall, at the election of the County, either immediately reimburse to the County or offset against payments otherwise due Contractor, the overstated amount plus interest. The foregoing remedy shall be in addition to any other rights or remedies the County may have.

13.2 Backcharges

Upon the County's notification to undertake or complete unperformed Work such as cleanup or to correct defective or non-conforming services, equipment, or material (Backcharge Work), if Contractor states or by its actions indicates it is unable or is unwilling to immediately proceed and/or complete the Backcharge Work in an agreed time; the County may perform such Backcharge Work by the most expeditious means available and backcharge Contractor for any and all costs thereby incurred by the County.

The County shall separately invoice or deduct and retain from payments otherwise due to Contractor the costs for Backcharge Work. The County's right to backcharge is in addition to any and all other rights and remedies provided in this Contract or by law. The County's performance of the Backcharge Work shall not relieve Contractor of any of its responsibilities under this Contract and Contractor shall be responsible for the Backcharge Work as if it were its own.

13.3 Applicable Law

Contractor and the Work must comply with all Applicable Law and the requirements of any applicable grant agreements.

13.4 Governing Law & Venue

The Contract shall be governed by the laws of the State of Florida. Venue for any administrative and/or legal action arising under the Contract shall be St. Johns County, Florida.

13.5 Assignment

Contractor shall not sell, assign or transfer any of its rights, duties or obligations under the Contract, or under any Change Order issued pursuant to the Contract or make an assignment or transfer of any amounts payable to Contractor under the Contract, without the prior written consent of the County. In the event of any assignment, Contractor remains secondarily liable for performance of the Contract, unless the County expressly waives such secondary liability. The County may assign the Contract with prior written notice to Contractor of its intent to do so. This Contract may be assumed by and shall inure to the benefit of the County's successors and assigns without the consent of Contractor.

13.6 Severability

If a court deems any provision of the Contract void, invalid or unenforceable, that provision shall be enforced only to the extent that it is not in violation of law or is not otherwise unenforceable and all other provisions shall remain in full force and effect.

13.7 Section Headings

The section and other headings contained in this Contract are for reference purposes only and shall not affect the meaning or interpretation of this Contract.

13.8 Disclaimer of Third-Party Beneficiaries

This Contract is solely for the benefit of County and Contractor and no right or cause of action shall accrue to or for the benefit of any third party not a formal party hereto. Nothing in this Contract, expressed or implied, is intended or shall be construed to confer upon or give any person or entity other than County and Contractor, any right, remedy, or Claim under or by reason of this Contract or any provisions or conditions hereof; and all of the provisions, representations, covenants and conditions herein contained shall inure to the sole benefit of and shall be binding upon County and Contractor.

13.9 Waiver; Course of Dealing

The delay or failure by the County to exercise or enforce any of its rights or remedies under this Contract shall not constitute or be deemed a waiver of the County's right thereafter to enforce those rights or remedies, nor shall any single or partial exercise of any such right or remedy preclude any other or further exercise thereof or the exercise of any other right or remedy. The conduct of the parties to this Contract after the Effective Date shall not be deemed a waiver or modification of this Contract.

13.10 No Waiver of Sovereign Immunity

Nothing herein is intended to serve as a waiver of sovereign immunity by any agency or political subdivision to which sovereign immunity may be applicable or of any rights or limits to liability existing under Section 768.28, Florida Statutes. This section shall survive the termination of all performance and obligations under this Contract and shall be fully binding until such time as any proceeding brought on account of this Contract is barred by any applicable statute of limitations.

13.11 Execution in Counterparts

This Contract may be executed in counterparts, each of which shall be an original document, and all of which together shall constitute a single instrument. The parties may deliver executed counterparts by e-mail transmission, which shall be binding. In the event this Contract is executed through a County-approved electronic signature or online digital signature service (such as DocuSign), such execution shall be valid, effective and binding upon the party so executing. Execution and delivery of an executed counterpart of this Contract and/or a signature page of this Contract by electronic image scan transmission (such as a "pdf" file) or through a County approved electronic signature service will be valid and effective as delivery of a manually executed counterpart of this Contract.

13.12 Entire Contract

This Contract, together with the Contract Documents for the Work, constitutes the entire Contract between County and Contractor relating to the subject matter hereof and supersedes all prior or contemporaneous Contracts, negotiations, discussions and understandings, oral or written. This Contract may not be amended or modified except in writing signed by both parties.

13.13 Survival

The provisions of the Contract Documents which by their nature survive termination of the Contract, including without limitation all warranties, indemnities, insurance, payment obligations, and the County's right to audit Contractor's books and records, shall in all cases survive the expiration or earlier termination of this Contract.

13.14 Employment Eligibility and Mandatory Use of E-Verify

As a condition precedent to entering into this Contract, and in accordance with section 448.095, F.S., Contractor and its subcontractors shall register with and use the E-Verify system to verify the work authorization status of all employees hired on or after January 1, 2021.

- a. Contractor shall require each of its subcontractors to provide Contractor with an affidavit stating that the subcontractor does not employ, contract with, or subcontract with an unauthorized alien. Contractor shall maintain a copy of such affidavit for the duration of this Contract.
- b. The County, Contractor, or any subcontractor who has a good faith belief that a person or entity with which it is contracting has knowingly violated section 448.09(1), F.S. or these provisions regarding employment eligibility shall terminate the contract with the person or entity.
- c. The County, upon good faith belief that a subcontractor knowingly violated these provisions regarding employment eligibility, but Contractor otherwise complied, shall promptly notify Contractor and Contractor shall immediately terminate the contract with the subcontractor.
- d. The County and Contractor hereby acknowledge and mutually agree that, a contract terminated pursuant to these provisions regarding employment eligibility is not a breach of contract and may not be considered as such. Any contract terminated pursuant to these provisions regarding employment eligibility may be challenged in accordance with section 448.095(2)(d), F.S.

- e. Contractor acknowledges that, in the event that the County terminates this Contract for Contractor's breach of these provisions regarding employment eligibility, then Contractor may not be awarded a public contract for at least one (1) year after such termination. Contractor further acknowledges that Contractor is liable for any additional costs incurred by the County as a result of the County's termination of this Contract for breach of these provisions regarding employment eligibility.
- f. Contractor shall incorporate in all subcontracts made pursuant to this Contract the provisions contained herein regarding employment eligibility.

13.15 Equal Employment Opportunity

During the performance of this Contract, Contractor agrees as follows:

13.15.1 Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, disability, age, sex (including sexual orientation and gender identity/expression), national origin (including limited English proficiency), marital status, or familial status. Contractor will take affirmative action to ensure that applicants and employees are treated during employment without regard to their race, color, religion, disability, sex, age, national origin, ancestry, marital status, sexual orientation, gender identity or expression, familial status, genetic information or political affiliation. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertisement, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.

13.15.2 Contractor will, in all solicitations or advertisements for employees placed for, by, or on behalf of Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, sexual orientation, gender identity or expression, familial status, or genetic information.

13.15.3 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 Contractor's legal duty to furnish information.

13.15.4 Contractor will send to each labor union or representatives of workers with which it has a collective bargaining Contract or other contract or understanding, a notice to be provided by the County, advising the labor union or workers' representative of Contractor's commitments under Section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

13.15.5 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.

13.15.6 Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the County and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

13.15.7 In the event of Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be cancelled, terminated or suspended in whole or in part and Contractor may be declared ineligible for further 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.

13.15.8 Contractor will include the provisions of paragraphs 13.15.1 through 13.15.8 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. Contractor will take such action with respect to any subcontractor or vendor as may be directed to the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, Contractor may request the United States to enter into such litigation to protect the interest of the United States.

13.16 Public Records

13.16.1 Contractor shall comply and shall require all of its Subcontractors to comply with the State of Florida's Public Records Statute (Chapter 119), specifically to:

- (1) Keep and maintain public records that ordinarily and necessarily would be required by the County in order to perform the Services;
- (2) Upon request from the County's custodian of public records, provide the County with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost as provided in Chapter 119, Florida Statutes, or as otherwise provided by Applicable Law;
- (3) Ensure that public records related to this Contract that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by Applicable Law for the duration of this Contract and following expiration of this Contract, or earlier termination thereof, if Contractor does not transfer the records to the County; and
- (4) Upon completion of this Contract, or earlier termination thereof, transfer, at no cost, to the County all public records in possession of Contractor or keep and maintain for inspection and copying all public records required by the County to perform the Work.

13.16.2 If Contractor, upon expiration of this Contract or earlier termination thereof i) transfers all public records to the County, Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements; and ii) keeps and maintains public records, Contractor shall meet all Applicable Law and requirements for retaining public records. All records stored electronically must be provided to the County, upon request from the County's custodian of public records, in a format that is compatible with the County's information technology systems.

13.16.3 Failure by Contractor to comply with the requirements of this section shall be grounds for immediate, unilateral termination of this Contract by the County.

IF CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO ITS DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT: (904) 209-0805, PUBLICRECORDS@SJCFL.US, [500 SAN SEBASTIAN VIEW, ST. AUGUSTINE, FLORIDA 32084](#)

13.17 Anti-Bribery

Contractor and its Subcontractors shall at all times during the term of this Contract comply with all anti-bribery and corruption laws that are applicable to the performance of this Contract. Contractor represents that it has not, directly or indirectly, taken any action which would cause it to be in violation of Chapter 838 of the Florida Statutes. Contractor shall immediately notify the County of any violation (or alleged violation) of this provision.

13.18 Convicted and Discriminatory Vendor Lists, and Scrutinized Companies

13.18.1 Contractor warrants that neither it nor any Subcontractor is currently on the convicted vendor list or the discriminatory vendor list maintained pursuant to Sections 287.133 and 287.134 of the Florida Statutes, or on any similar list maintained by any other state or the federal government. Contractor shall immediately notify the County in writing if its ability to perform is compromised in any manner during the term of the Contract.

13.18.2 Section 287.135 of the Florida Statutes prohibits agencies from contracting with companies for goods or services that are on the Scrutinized Companies that Boycott Israel List, or with companies that are engaged in a boycott of Israel, and from contracting with companies for goods or services of \$1,000,000 or more that are on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or are engaged in business operations in Cuba or Syria. The lists are created pursuant to §215.473 and §215.4725, F.S. By execution of this Contract, Contractor certifies that it is not listed on the Scrutinized Companies that Boycott Israel List, the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, and is not engaged in a boycott of Israel or engaged in business operations in Cuba or Syria, and understands that pursuant to §287.135, F.S., the submission of a false certification may subject Contractor to civil penalties, attorney's fees, and/or costs. In accordance with §287.135, F.S., the County may terminate this Contract if a false certification has been made, or the Contractor is subsequently placed on any of these lists, or engages in a boycott of Israel or is engaged in business operations in Cuba or Syria.

13.19 Written Notice

Any and all notices, requests, consents, approvals, demands, determinations, instructions, and other forms of written communication under this Contract shall be validly given when delivered as follows:

- i. Hand delivered to Contractor's Authorized Representative or hand delivered during normal business hours and addressed as shown below, or
- ii. Delivered by U.S. Mail, electronic mail or commercial express carrier, (postage prepaid, delivery receipt requested), to the following addresses:

St. Johns County
500 San Sebastian View
St. Augustine, FL 32084
Attn: Brian Pinkerton
Email Address: bprinterton@sjcfl.us

SGS Contracting Services, Inc.
PO Box 908
High Springs, FL 32655
Attn: Seth Simmons
Email Address: seth@sgscsi.com

With a copy to:

St. Johns County
Office of the County Attorney
500 San Sebastian View
St. Augustine, FL 32084
Email Address: jferguson@sjcfl.us

Notices shall be deemed to have been given on the date of delivery to the location listed above without regard to actual receipt by the named addressee. County and Contractor may each change the above addresses at any time upon prior written notice to the other party.

The authorized representatives hereto have executed this Contract effective as of the Effective Date. Contractor's authorized representative executing this Contract represents that he or she is duly authorized to execute this Contract on behalf of Contractor.

County

St. Johns County (Seal)
(Typed Name)

By: _____
(Signature of Authorized Representative)

(Printed Name)

(Title)

(Date of Execution)

Contractor

SGS Contracting Services, Inc. (Seal)
(Typed Name)

By: _____
(Signature of Authorized Representative)

(Printed Name)

(Title)

(Date of Execution)

ATTEST:
St. Johns County, FL
Clerk of the Circuit Courts & Comptroller

By: _____
(Deputy Clerk)

(Date of Execution)

Legally Sufficient:

(Office of County Attorney)

(Date of Execution)

FORM 1
CERTIFICATION OF PAYMENTS TO SUBCONTRACTORS

Contract No.	21-MCS-SGS-15541
Project Title:	Northwest Well No. 7 Wellhead and Site Improvements

The undersigned Contractor hereby swears under penalty of perjury that:

1. Contractor has paid all Subcontractors all undisputed contract obligations for labor, services, or materials provided on this Project within the time period set forth in Sections 218.73 and 218.735, Florida Statutes, as applicable.
2. The following Subcontractors have not been paid because of disputed contractual obligations; a copy of the notification sent to each, explaining the good cause why payment has not been made, is attached to this form:

Subcontractor Name and Address	Date of Disputed Invoice	Amount in Dispute

Contractor's Authorized Representative executing this Certification of Payments to Subcontractors represents that he or she is duly authorized to execute this Certificate, or if executing on behalf of another, is authorized to do so and that such Authorized Representative is legally bound.

Dated _____, 20__

Contractor _____

By: _____
 (Signature)

By: _____
 (Name and Title)

STATE OF _____)
) SS.
 COUNTY OF _____)

The foregoing instrument was acknowledged before me, by means of physical presence or online notarization, this _____ day of _____, 20__, by _____, who is personally known to me or who has produced _____ as identification and who did (did not) take an oath.

NOTARY PUBLIC:

Signature: _____

Print Name: _____

(NOTARY SEAL)

My commission expires:

**PM NOTE: This Certificate of Substantial Completion may be issued on department letterhead.
Delete all PM Notes prior to issuing.**

FORM 2
CERTIFICATE OF SUBSTANTIAL COMPLETION

Contract No.: 21-MCS-SGS-15541	Project (name & address): Northwest Well No. 7 Wellhead and Site Improvements
Contractor (name & address): SGS Contracting Services, PO Box 908 High Springs, FL 32655	St Johns County, FL Project Manager: Alan Flood Notice to Proceed Date:
Date of Substantial Completion:	

The Work performed under this Contract has been reviewed and found to be substantially complete and all documents required to be submitted by Contractor under the Contract Documents have been received and accepted. The date of Substantial Completion of the Project is the date established by this Certificate.

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of Contractor to complete all of the Work in accordance with the Contract Documents.

Contractor is notified as follows:

1. Without limitation of Contractor's obligation to fully complete the Work within the Contract Time, Contractor shall complete or correct the Work on the list of items attached hereto within _____ () days from the date of Substantial Completion.

2. Contractor shall be responsible for all Contract requirements, except items or responsibilities of the County set forth below, including but not limited to continued insurance coverages.

PM NOTE: Insert County responsibilities following SC (i.e. security, maintenance, and utilities) or enter N/A

3. The warranty described in the Contract will be in effect for a period of one (1) year from and after the date of Final Completion.

4. List of items to be completed or corrected: see attached punch list (Exhibit A).

5. Upon completion of the punch list items, the County will issue a Final Certificate for Payment.

Project Manager

Signature

Date

PM NOTE – Attach list of punch list items.

PM NOTE: This Final Certificate for Payment may be issued on department letterhead.

**FORM 3
FINAL CERTIFICATE FOR PAYMENT**

Contract No.: 21-MCS-SGS-15541	Project (name & address): Northwest Well No. 7 Wellhead and Site Improvements
Contractor (name & address): SGS Contracting Services, Inc. PO Box 908 High Springs, FL 32655	Project Manager: Alan Flood
Date of Issuance:	Bid No.: 22-34
	Notice to Proceed Date:

All conditions or requirements of any permits or regulatory agencies have been satisfied. The documents required pursuant to the terms and conditions of the Contract, and the final bill of materials, if required, have been received and accepted. The Work required by the Contract Documents has been reviewed and the undersigned certifies that the Work, including minor corrective work, has been completed in accordance with the provisions of the Contract Documents and is accepted under the terms and conditions thereof.

The County, through its Project Manager, accepts the Work as fully complete and will assume full possession thereof at _____ on _____.
(time) (date)

ST. JOHNS COUNTY: _____
Project Manager Signature Date

CONTRACTOR'S FINAL RELEASE AND WAIVER OF LIEN

Owner: St. Johns County (hereafter "County")	County Department/Division:
Contract No.: 21-MCS-SGS-15541	Contractor Name: SGS Contracting Services, Inc.
Project: Northwest Well No. 7 Wellhead and Site Improvements	Contractor Address: PO Box 908, High Springs, FL 32655
Project Address: St Johns County, FL	Contractor License No.: CGC1514772
Payment Amount:	Amount of Disputed Claims:

The undersigned has been paid in full for all labor, work, services, materials, equipment, and/or supplies furnished to the Project or to the County and does hereby waive and release any notice of lien, any right to mechanic's lien, any bond right, any claim for payment and any rights under any similar ordinance, rule or statute related to a claim or payment rights the undersigned has on the above described Project, except for the payment of Disputed Claims, if any, described below.

The undersigned warrants that he or she either has already paid or will use the monies received from this final payment to promptly pay in full all of its laborers, subcontractors, materialmen and suppliers for all labor, work, services, materials, equipment, or supplies provided for or to the above referenced Project.

Before any recipient of this document relies on it, the recipient should verify evidence of payment to the undersigned.

Disputed Claims: The following invoices, pay applications, retention, or extra work are reserved by undersigned from this final payment (if there are no Disputed Claims enter "**None**"):

None

Signed this ___ day of _____, 20__

Contractor/Company Name

By:

Signature

Printed Name

Title

NOTICE: THIS DOCUMENT WAIVES RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT TO THE EXTENT OF THE PAYMENT AMOUNT OR THE AMOUNT RECEIVED.



St. Johns County Board of County Commissioners

Purchasing Division

NOTICE OF INTENT TO AWARD

December 17, 2021

RE: Bid No: 22-34; Northwest Well #7 Wellhead and Site Improvements

Please be advised that the St. Johns County Purchasing Division is issuing this Notice of Intent to Award a contract to SGS Contracting Services, Inc., as the lowest, responsive, responsible bidder for the completion of Bid No: 22-34: Northwest Well #7 Wellhead and Site Improvements. This notice will remain posted until 4:00 PM, December 22, 2021.

Any person (including any bidder or proposer) who is, or claims to be, adversely affected by the County's decision or proposed decision shall file a written Notice of Protest with the Purchasing Division of St. Johns County within 72 hours after the posting of the notice of decision or proposed decision. Failure to file a Notice of Protest within the time prescribed in Section 304.10 of the St. Johns County Purchasing Manual (the Bid Protest Procedure), or failure to post the bond or other security required by the County within the time allowed for filing a bond, shall constitute a waiver of proceedings and a waiver of the right to protest. The protest procedures may be obtained from the Purchasing Division and are included in the County's Purchasing Manual. All of the terms and conditions of the County Purchasing Manual are incorporated herein by reference and are fully binding.

Should the Purchasing Division receive no protests in response to this notice, an agenda item will be submitted to the St. Johns County Board of County Commissioners for their consideration and subsequent approval to award and execute a contract.

Please forward all questions or inquiries related to this project to David E. Pyle, CPPB, Procurement Coordinator, at dpyle@sjcfl.us.

Sincerely,
St. Johns County, FL
Board of County Commissioners


County Representative Signature

Date: 12/17/21

Leigh A Daniels, CPPB
Purchasing Manager
(904) 209-0154 – Direct
(904) 209-0155 – Fax
ldaniels@sjcfl.us



ST. JOHNS COUNTY PURCHASING DEPARTMENT

500 San Sebastian View
St. Augustine, Florida 32084

I N T E R O F F I C E M E M O R A N D U M

TO: Scott Trigg/Alan Flood
FROM: David E. Pyle; Procurement Coordinator
SUBJECT: Bid No. 22-34; Northwest Well #7 Wellhead and Site Improvements
DATE: December 16, 2021

Attached are copies of the bid proposals received for the above mentioned bid along with a copy of the Bid Tabulation Sheet.

Please review, evaluate and make a written recommendation for this project. Also, indicate the budgeted amount for this item along with the appropriate charge code and return at your earliest convenience. We will prepare the agenda item and contract.

Please let me know if I can assist your department in any other way.

Department Head Approval

Scott Trigg

Date

December 16, 2021

Budget Amount

\$500,000.00

Account Funding Title

Northwest Well #7 Wellhead and Site Improvements

Funding Charge Code

4484-56302-6268-56302

Award to

SGS Contracting Services, Inc.

Award Amount

\$414,700.00

**ST. JOHNS COUNTY
BID TABULATION**

BID TITLE Northwest Well #7 Wellhead and Site Improvements

BID NUMBER 22-34
OPENING DATE/TIME December 15, 2021 2:00 PM

ANY BIDDER AFFECTED ADVERSELY BY AN INTENDED
 DECISION WITH RESPECT TO THE AWARD OF ANY BID,
 SHALL FILE WITH THE PURCHASING DEPARTMENT FOR
 ST. JOHNS COUNTY, A WRITTEN NOTICE OF INTENT
 FILE A PROTEST NOT LATER THAN SEVENTY-TWO (72)
 HOURS (EXCLUDING SATURDAY, SUNDAY AND LEGAL
 HOLIDAYS) AFTER THE POSTING OF THE BID TABULATION
 PROTEST PROCEDURES MAY BE OBTAINED IN THE
 PURCHASING DEPARTMENT.

OPENED BY DAVID E. PYLE
TABULATED BY LEIGH DANIELS
VERIFIED BY DAVID E. PYLE

POSTING DATE/TIME 12/16/21 12:00 PM 12/21/21 12:00 PM

BIDDERS	TOTAL BID PRICE						
PBM Constructors, Inc.	\$609,000.00						
G&H Underground Construction, Inc.	\$577,000.00						
SGS Contracting Services, Inc.	\$414,700.00						

BID AWARD DATE - _____

OFFICIAL COUNTY BID FORM
ST. JOHNS COUNTY, FLORIDA

TO: THE BOARD OF COUNTY COMMISSIONERS OF ST. JOHNS COUNTY, FLORIDA

DATE SUBMITTED: 12-15-2021

BID PROPOSAL OF

SGS Contracting Services, Inc.

Full Legal Company Name

PO Box 908, High Springs, FL 32655	386-361-5300	N/A
Mailing Address	Telephone Number	Fax Number

Bidders: Having become familiar with requirements of the project, and having carefully examined the Bid Documents and Specifications entitled for Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements in St. Johns County, Florida, the undersigned proposes to furnish all materials, labor and equipment, supervision and all other requirements necessary to comply with the Contract Documents to submit the following Bid Proposal summarized as follows:

LUMP SUM BASE BID PRICE:

\$ 394,700
Lump Sum Base Bid Price (Numerical)

Three Hundred Ninety Four Thousand Seven Hundred /100 Dollars
Lump Sum Base Bid Price (Amount written or typed in words)

***LABORATORY TEST ALLOWANCE (for soil density and concrete):** \$ 10,000.00

***RESTRAINT ALLOWANCE (at the tie-in point):** \$ 10,000.00

**These allowances are estimated unit price allowances that will be adjusted (+/-) based upon actual costs for applicable testing, and must be verified by an invoice from the testing facility.*

TOTAL BID PRICE (Lump Sum Base Bid + Total Test Allowance + Restraint Allowance):

\$ 414,700
Total Bid Price (Numerical)

Four Hundred Fourteen Thousand Seven Hundred /100 Dollars
Total Bid Price (Amount written or typed in words)

Bidder shall insert the Total Bid Price amount in numerals and in words. In the event of a discrepancy between the two amounts, the amount written in words will prevail. The Total Bid Price shall be the amount derived from adding the Lump Sum Base Bid amount and the provided allowances. If a math error occurs, the County shall re-calculate based upon the Lump Sum Base Bid and allowance amounts to determine the correct Total Bid Price.

BID NO: 22-34

During the preparation of the Bid, the following addenda, if any, were received:

No.:	<u>1</u>	Date Received:	<u>12-06-2021</u>
No.:	<u> </u>	Date Received:	<u> </u>
No.:	<u> </u>	Date Received:	<u> </u>

The Undersigned hereby declares that no person or persons, firm, or corporation, other than the undersigned are interested in this bid proposal, as principals, and that this bid proposal is made without collusion with any person, firm, or corporation, and the undersigned has carefully examined, and is thoroughly familiar with the requirements and specifications of this Bid.

The Undersigned certifies that a full examination of the locations of the proposed work and the sources of supply of materials has been completed, and agrees to furnish all necessary labor, equipment and materials, fully understanding that any quantities shown herein are approximate only, and will fully complete all requirements provided herein within the same time limit specified in the Bid Documents as indicated above.

If the Undersigned is notified of the acceptance of this Bid by the County within ninety (90) consecutive calendar days for the time set from the time set for opening of Bids, the Undersigned further agrees, to execute a contract for the above work within ten (10) days after notice that his Bid has been accepted for the above stated compensation in the form of a Contract presented by the Owner.

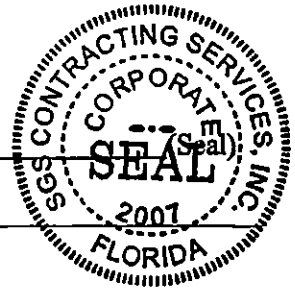
The Undersigned further agrees that security in the form of a Bid Bond, certified or cashier's check in the amount of not less than five percent (5%) of Total Bid Price, payable to the Owner, accompanies this Bid; that the amount is not to be construed as a penalty, but as liquidated damages which said Owner will sustain by failure of the Undersigned to execute and deliver the Contract and Bond within ten (10) days of the written notification of the Award of the Contract to him; thereupon, the security shall become the property of the Owner, but if this Bid is not accepted within ninety (90) days of the time set for the submission of Bids, or if the Undersigned delivers the executed Contract upon receipt, the Security shall be returned to the Bidder within seven (7) working days.

The undersigned pledges to provide the materials and services as specified in the Bid Documents barring delays due to strikes, fires, transportation difficulties or other causes beyond the control of the undersigned.

The undersigned declares that the statements and representations made in this bid proposal are true in every respect and that the said proposal is, in all respects, fair and made without collusion or fraud, and that no member of the St. Johns County Board, or any other agent or employee of the County, directly or indirectly, is interested in this proposal or in any profits expected to accrue therefrom

BID NO: 22-34

CORPORATE/COMPANY



Full Legal Company Name: SGS Contracting Services, Inc.

By: [Signature]
Signature of Authorized Representative

Seth Simmons
(Name & Title typed or printed)

By: N/A
Signature of Authorized Representative

(Name & Title typed or printed)

Address: PO Box 908, High Springs, FL 32655

Telephone No.: () 386-361-5300

Fax No.: () N/A

Email Address for Authorized Company Representative: seth@sgscsi.com

Federal I.D. Tax Number: 46-1147891

DUNS #: N/A
(If applicable)

INDIVIDUAL

Name: _____
(Signature) (Name typed or printed) (Title)

Address: _____

Telephone No.: () _____ Fax No.: _____

Email Address: _____

Federal I.D. Tax Number: _____

Submittal Requirements:

Official County Bid Form

- Attachment "A" – St Johns County Board of County Commissioners Affidavit
- Attachment "B" – Certificate as to Corporate Principal
- Attachment "C" – License/Certification List
- Attachment "D" – List of Proposed Sub-Contractors/Suppliers
- Attachment "E" – Conflict of Interest Disclosure Form
- Attachment "F" – Certificate of Compliance with Florida Trench Safety Act
- Attachment "G" – Proof of Insurance
- Attachment "H" – Contractor's Qualifications Form
- Attachment "I" – Drug Free Workplace Form
- Attachment "J" – Claims, Liens, Litigation History
- Attachment "K" – E-Verify Affidavit
- Attachment "L" – Local Preference
- Bid Bond
- Sealed Bid Mailing Label

Official County Bid Form, Attachments, and Bid Bond must be completed, along with a fully acknowledged copy of each Addendum applicable to this Bid and submitted with each copy of the Bid Proposal. One (1) original and two (2) copies of all required forms must be submitted.

ATTACHMENT "A"

BID PROPOSAL AFFIDAVIT

TO: ST. JOHNS COUNTY, BOARD OF COUNTY COMMISSIONERS,
ST. AUGUSTINE, FLORIDA.

At the time the proposal is submitted, the Bidder shall attach to his Bid a sworn statement.

This sworn statement shall be an affidavit in the following form, executed by an officer of the firm, association, or corporation submitting the proposal, and shall be sworn to before a person who is authorized by law to administer oaths.

STATE OF FL
COUNTY OF Alachua

The Undersigned authority, Seth Simmons (Affiant), who being duly sworn, deposes and says he/she is President (Title) of the firm of SGS Contracting Services, Inc. (Bidder), submitting the attached bid proposal for the services covered by the bid documents for Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements, in St. Johns County, Florida.

The affiant further states that no more than one bid proposal for the above-referenced project will be submitted from the individual, his/her firm or corporation under the same or different name, and that such Bidder has no financial interest in the firm of another bidder for the same work. That neither the individual, his/her firm, association nor corporation has either directly or indirectly entered into any agreement, participated in any collusion, nor otherwise taken any action in restraint of free competitive bidding in connection with this firm's Bid on the above-described project. Furthermore, neither the firm nor any of its officers are barred from participating in public contract lettings in the State of Florida or any other state.

DATED this 15 day of December, 20 21.



Signature of Affiant

Seth Simmons

Printed Name of Affiant

President

Printed Title of Affiant

SGS Contracting Services, Inc.

Full Legal Name of Consultant/Contractor

Sworn to (or affirmed) and subscribed before me by means of physical presence or online notarization, this _____ day of December 15, 20 21, by Seth Simmons, President (Name & Title of Affiant), who is personally known to me or has produced _____ as identification.



Michelle Burgess
Notary Public
My Commission Expires: 06-28-22

BIDDER MUST EXECUTE AND ATTACH THIS AFFADAVIT TO BID.

BID NO: 22-34

ATTACHMENT "F"

CERTIFICATE OF COMPLIANCE WITH FLORIDA TRENCH SAFETY ACT

Bidder acknowledges that he is solely responsible for complying with the Florida Trench Safety Act (ACT) and Occupational Safety and Health Administrations excavation safety standard 29 CFR 1926.650 (Subpart P as amended) and the St. Johns County Trenching and Excavation Safety Program. If there is a conflict between the ACT and the St. Johns County Trenching and Excavation Safety Program, the more stringent requirement would apply. Bidder further acknowledges that included in the various items of the proposal and in the Total Bid Price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) effective October 1, 1990 and the Occupational Safety and Health Administrations excavation safety standard.

By: 

Authorized Representative Signature

Seth Simmons / President

Printed Name & Title

12-15-2021

Date

BID NO: 22-34

ATTACHMENT "G"

CERTIFICATE OF INSURANCE

INSERT CERTIFICATE OF INSURANCE HERE

Bidders shall provide certificates of insurance reflecting the required coverages, or certification from a qualified insurance provider as to the Bidder's ability to obtain the required coverages upon award, as part of their bid proposal. Certificates of Insurance shall meet or exceed the requirements as described under Insurance.

Failure to provide proof of current insurance coverage or ability to obtain the required coverages may result in being deemed non-responsive and remove from further consideration.

(Attach or insert a copy of "Certificate of Insurance" here)



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

5/26/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Acentria Insurance – Newberry 216 NW 135th Way, Suite 30 Newberry FL 32669 License#: L100460 SGSCONT-01	CONTACT NAME: Thomas Griffin	
	PHONE (A/C, No, Ext): 3525051953	FAX (A/C, No):
E-MAIL ADDRESS: thomas.griffin@acentria.com		
INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A: Evanston Insurance Company		35378
INSURER B: Auto-Owners Insurance Company		18986
INSURER C: Bridgefield Casualty Insurance Company		10335
INSURER D: Southern-Owners Insurance Company		10190
INSURER E:		
INSURER F:		

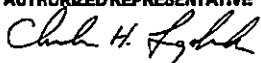
COVERAGES **CERTIFICATE NUMBER: 560386761** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GENL AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			MKLV2ENV102216	4/26/2021	4/26/2022	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 \$
B	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			5280685600	4/26/2021	4/26/2022	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$			MKLV2EFX100677	4/26/2021	4/26/2022	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000 \$
C	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A	188-52077	1/1/2021	1/1/2022	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
A A D	Professional Liability Pollution Liability Leased/Rented Equipment			MKLV2ENV102216 MKLV2ENV102216 78806880	4/26/2021 4/26/2021 4/26/2021	4/26/2022 4/26/2022 4/26/2022	Each Claim 1,000,000 Each Occurrence 1,000,000 Limit 100,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

This is a sample COI, which shows all current coverages for the insured and is intended to be used for bidding purposes. Umbrella coverage is above other coverages. Coverages can be adjusted as needed for project-specific requirements.

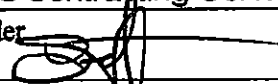
CERTIFICATE HOLDER SAMPLE - FOR BIDDING PURPOSES ONLY	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
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ATTACHMENT "H"

CONTRACTOR'S QUALIFICATIONS FORM

Bidder acknowledges that he is fully licensed to perform work in the State of Florida. Any material misrepresentation, as determined by the County, shall result in disqualification.

By: SGS Contracting Services, Inc.
Bidder 
Authorized Signature

12-15-2021
Date

Contractor's Project Experience

Prime bidder must be fully licensed to do business in the State of Florida and hold a current Certified General Contractor's license Bidders must have successfully completed, as a Prime or Sub-contractor, at least three (3) projects, in the past five (5) years, of similar type, size and dollar value of the project described herein. One or more of these three (3) projects must include the installation of wellhead, vertical turbine pump, 12" and larger flanged and mechanical joint pipe, fittings, and valves, and a generator in a remote setting. The dollar value of similar projects must be at least 75% of the submitted bid.

Contractor's Project Experience Details	
Project No. 1	
Name of Project:	
Project Manager Name:	
Superintendent Name:	
Project Description:	
Owner Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Engineer/Architect Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Contract Dates	
Started:	
Original Contractual Completion:	

SEE ATTACHED

BID NO: 22-34

Contractor's Project Experience Details	
Project No. 1	
Final Contractual Completion:	
Actual Completion:	
Contract Value	
Original Contract Value:	
Final Contract Value:	
Value of Change Orders to Date:	
Value of Outstanding Claims to Date:	
Bonding Company Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Major Subcontractor Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	

SEE ATTACHED

Contractor's Project Experience Details	
Project No. 2	
Name of Project:	
Project Manager Name:	
Superintendent Name:	
Project Description:	
Owner Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Engineer/Architect Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Contract Dates	
Started:	
Original Contractual Completion:	
Final Contractual Completion:	
Actual Completion:	
Contract Value	
Original Contract Value:	
Final Contract Value:	
Value of Change Orders to Date:	
Value of Outstanding Claims to Date:	
Bonding Company Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	

SEE ATTACHED

Contractor's Project Experience Details Project No. 2	
Major Subcontractor Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	

Contractor's Project Experience Details Project No. 3	
Name of Project:	
Project Manager Name:	
Superintendent Name:	
Project Description:	
Owner Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Engineer/Architect Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	

SEE ATTACHED

BID NO: 22-34

Contractor's Project Experience Details Project No. 3	
Contract Dates	
Started:	
Original Contractual Completion:	
Final Contractual Completion:	
Actual Completion:	
Contract Value	
Original Contract Value:	
Final Contract Value:	
Value of Change Orders to Date:	
Value of Outstanding Claims to Date:	
Bonding Company Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Major Subcontractor Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	

SEE ATTACHED

Additional Questions

Do you have any similar work in progress at this time? Yes No

Length of time in business: 14 years

ATTACHMENT "I"

DRUG-FREE WORKPLACE FORM

The undersigned firm, in accordance with Florida Statute 287.087 hereby certifies that
SGS Contracting Services, Inc. does:

Name of Firm

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the danger of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, employee assistance programs and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the contractual services that are described in St. Johns County's request for proposals to provide bond underwriter services a copy of the statement specified in paragraph 1.
4. In the statement specified in paragraph 1, notify the employees that, as a condition of working on the contractual services described in paragraph 3, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Florida Statute 893, as amended, or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction or plea.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community by, any employee who is so convicted.
6. Consistent with applicable provisions with State or Federal law, rule, or regulation, make a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs 1 through 5.

As the person authorized to sign this statement, I certify that this firm complies fully with the above requirements.



Signature

12-15-2021

Date

ATTACHMENT "J"

CLAIMS, LIENS, LITIGATION HISTORY
(Complete and Submit)

- 1. Within the past 7 years, has your organization filed suit or a formal claim against a project owner (as a prime or subcontractor) or been sued by or had a formal claim filed by an owner, subcontractor or supplier resulting from a construction dispute? Yes _____ No X If yes, please attach additional sheet(s) to include:

Description of every action Captions of the Litigation or Arbitration
 Amount at issue: N/A Name (s) of the attorneys representing all parties:

Amount actually recovered, if any: N/A
 Name(s) of the project owner(s)/manager(s) to include address and phone number:

- 2. List all pending litigation and or arbitration. N/A
- 3. List and explain all litigation and arbitration within the past seven (7) years - pending, resolved, dismissed, etc. N/A
- 4. Within the past 7 years, please list all Liens, including Federal, State and Local, which have been filed against your Company. List in detail the type of Lien, date, amount and current status of each Lien. N/A
- 5. Have you ever abandoned a job, been terminated or had a performance/surety bond called to complete a job? Yes X No _____ If yes, please explain in detail: _____
Contract Termination Only - See attached
No bond or surety issues
- 6. For all claims filed against your company within the past five-(5) years, have all been resolved satisfactorily with final judgment in favor of your company within 90 days of the date the judgment became final? Yes _____ No _____
 If no, please explain why? N/A
- 7. List the status of all pending claims currently filed against your company: N/A

Liquidated Damages

- 1. Has a project owner ever withheld retainage, issued liquidated damages or made a claim against any Performance and Payment Bonds? Yes _____ No X If yes, please explain in detail: _____

(Use additional or supplemental pages as needed)

ATTACHMENT "K"

E-VERIFY AFFIDAVIT

Contract No.: Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements

STATE OF FL
COUNTY OF Alachua

I, Seth Simmons (hereinafter "Affiant"), being duly authorized by and on behalf of SGS Contracting Services, Inc. (hereinafter "Contractor") hereby swears or affirms as follows:

1. Contractor understands that E-Verify, authorized by Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA), is a web-based system provided by the United States Department of Homeland Security, through which employers electronically confirm the employment eligibility of their employees.
2. For the duration of Contract No. Bid 22-34 (hereinafter "Agreement"), in accordance with section 448.095, F.S., Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Contractor and shall expressly require any subcontractors performing work or providing services pursuant to the Agreement to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor.
3. Contractor shall comply with all applicable provisions of section 448.095, F.S., and will incorporate in all subcontracts the obligation to comply with section 448.095, F.S.
4. Contractor understands and agrees that its failure to comply with all applicable provisions of section 448.095, F.S. or its failure to ensure that all employees and subcontractors performing work under the Agreement are legally authorized to work in the United States and the State of Florida constitute a breach of the Agreement for which St. Johns County may immediately terminate the Agreement without notice and without penalty. The Contractor further understands and agrees that in the event of such termination, Contractor shall be liable to the St. Johns County for any costs incurred by the St. Johns County resulting from Contractor's breach.

DATED this 15 day of December, 2021.

[Signature]
Signature of Affiant

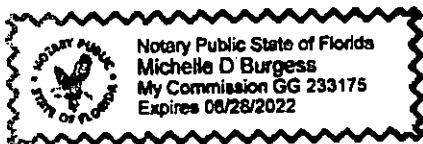
Seth Simmons
Printed Name of Affiant

President
Printed Title of Affiant

SGS Contracting Services, Inc.
Full Legal Name of Consultant/Contractor

Sworn to (or affirmed) and subscribed before me by means of physical presence or online notarization, this day of 12-15, 2021, by Seth Simmons {insert name and title of Affiant}, who is personally known to me or has produced _____ as identification.

[Signature]
Notary Public
My Commission Expires: 6-26-22



ATTACHMENT "L"

LOCAL PREFERENCE

Any Respondent that meets the criteria of a Local Business, in accordance with Section 302.25 of the SJC Purchasing Procedure Manual, must complete and sign this Attachment "T" to indicate their qualification to receive local preference. All required documentation to demonstrate that the Respondent meets all qualification criteria as a local business must be included in the submitted proposal/submittal with this Attachment "L".

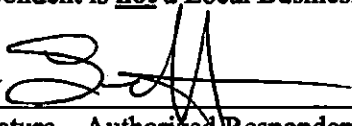
In order to qualify for local preference Respondent must provide sufficient documentation to demonstrate:

- A physical, brick and mortar place of business located within the geographic boundaries of St. Johns County, with a valid mailing address, in an area zoned for the conduct of such business, from which the Vendor has operated or performed business on a day-to-day basis that is substantially similar to those specified in the solicitation for a period of at least one (1) calendar year prior to the issuance of the solicitation. No PO Boxes shall be accepted.
- Local address above must be registered as the Vendor's principal place of business with the Divisions of Corporations Florida Department of State for at least one (1) calendar year prior to the issuance of this BID.
- Submit current and valid Local Business Tax Receipt, and must have Local Business Tax Receipts issued by the St. Johns County Tax Collector from at least one (1) calendar year prior to issuance of this BID.
- Must qualify as a local business as shown above AND self-perform a minimum of fifty percent (50%) of all services under the awarded Contract, or must have a minimum of fifty percent (50%) of all services performed by qualified local businesses as sub-contractors or sub-consultants.

If qualifying for local preference through the use of qualified local sub-contractors or sub-consultants, Respondent must submit all required documentation to demonstrate the above requirements of all proposed sub-contractors and sub-consultants for local preference consideration with the submitted proposal.

Respondent is a Local Business as defined in Section 302.25, SJC Purchasing Procedure Manual _____

Respondent is not a Local Business as defined in Section 302.25, SJC Purchasing Procedure Manual X _____



Signature – Authorized Respondent Representative

Seth Simmons / President

Printed Name & Title

12-15-2021

Date of Signature

SGS CONTRACTING SERVICES, INC.

PROJECT HISTORY

CURRENT PROJECTS

TITLE: GAINESVILLE REGIONAL UTILITIES (GRU) GENERAL SERVICE AGREEMENT FOR WATER/WASTEWATER OPERATIONS

CONTRACT VALUE: Indefinite Value	SCHEDULED COMPLETION: N/A	SERVICE: Potable Water Wastewater
CONSULTANT: N/A	GENERAL CONTRACTOR: SGS Contracting Services, Inc.	OWNER: City of Gainesville (GRU) Rachel Lockhart
DESCRIPTION: General service agreement for repair, rehab and new construction of water resource facilities throughout the utility. Scope of allowable work is unlimited within the facilities.		

TITLE: FGUA GENERAL SERVICE CONTRACT FOR UTILITY CONTRACTORS

CONTRACT VALUE: Indefinite Value	SCHEDULED COMPLETION: N/A	SERVICE: Potable Water Wastewater
CONSULTANT: N/A	GENERAL CONTRACTOR: SGS Contracting Services, Inc.	OWNER: FGUA
DESCRIPTION: General service agreement for repair, rehab and new construction of water resource facilities throughout the utility. Scope of allowable work is unlimited within the facilities.		

TITLE: ST. JOHNS COUNTY UTILITY DEPARTMENT SERVICE CONTRACT FOR UTILITY CONTRACTORS

CONTRACT VALUE: Indefinite Value	SCHEDULED COMPLETION: N/A	SERVICE: Potable Water Wastewater
CONSULTANT: N/A	GENERAL CONTRACTOR: SGS Contracting Services, Inc.	OWNER: St. Johns Co. Utility Dept.
DESCRIPTION: General service agreement for repair, rehab and new construction of water resource facilities throughout the utility. Scope of allowable work is unlimited within the facilities.		

TITLE: FERNANDINA BEACH WRF CLARIFIER #1 IMPROVEMENTS

CONTRACT VALUE: \$434,700 (original) \$434,700 (current)	SCHEDULED COMPLETION: April 2022	SERVICE: Wastewater
CONSULTANT: N/A	GENERAL CONTRACTOR: SGS Contracting Services, Inc.	OWNER: City of Fernandina Beach Charles George
DESCRIPTION: Replacement of 80' diameter clarifier mechanism and weirs/baffles.		

TITLE: ST CLOUD WTP #1 HYDRGEN SULFIDE PRETREATMENT SYSTEM

CONTRACT VALUE: \$1,105,170 (original) \$1,105,170 (current)	SCHEDULED COMPLETION: January 2022	SERVICE: Water
CONSULTANT: Reiss Engineering	GENERAL CONTRACTOR: SGS Contracting Services, Inc.	OWNER: City of St Cloud
DESCRIPTION: Construction of a hydrogen sulfide pretreatment system, including odor control system, duct, piping, electrical, and controls.		

TITLE: CITY OF WINTER SPRINGS EAST & WEST WRF'S PRIORITY REPAIRS

CONTRACT VALUE: \$1,669,700 (original) \$1,925,722 (current)	SCHEDULED COMPLETION: June 2022	SERVICE: Wastewater
CONSULTANT: CPH Dave Mehler	GENERAL CONTRACTOR: SGS Contracting Services, Inc.	OWNER: City of Winter Springs
DESCRIPTION: Misc. improvements and repairs on four (4) ring steel package plants, including screening improvements and heavy structural steel.		

TITLE:		TOWN OF TRENTON CDBG NR 19 WTF & WWTF IMP			
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:	
\$321,700	(original)	January 2022		Wastewater	
\$321,700	(current)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mittauer & Associates		SGS Contracting Services, Inc.		Town of Trenton	
Jason Shepler					
DESCRIPTION:					
				Misc. improvements at each facility, including flowmeters, clarifier, pumping and screening improvements.	
TITLE:		MULLINS ROWTP ODOR CONTROL IMPROVEMENTS			
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:	
\$1,837,670	(original)	April 2022		Potable Water	
\$1,837,670	(current)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Jacobs		SGS Contracting Services, Inc.		City of Melbourne	
GJ Schers				Tom Baker	
DESCRIPTION:					
				Installation of new odor control equipment, including ductwork, piping, structural concrete and misc. metals. Includes new controls and Electrical installation for odor control equipment.	
TITLE:		LAKE CITY SM WWTF AERATOR REPLACEMENT PROJECT			
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:	
\$1,471,700	(original)	January 2022		Wastewater	
\$1,740,400	(current)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mittauer & Associates		SGS Contracting Services, Inc.		City of Lake City	
Tim Norman				Cody Prigeon	
DESCRIPTION:					
				Replacement of oxidation ditch aeration equipment. Includes grit removal/disposal services for aeration basins.	
TITLE:		HAINES CITY WWTP DISC FILTER PROJECT			
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:	
\$1,344,700	(original)	March 2022		Wastewater	
\$1,344,700	(current)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Reiss Engineering		SGS Contracting Services, Inc.		City of Haines City	
DESCRIPTION:					
				Construction of two (2) new disc filter units, modifications of existing filter basin, large yard piping, electrical and controls.	
TITLE:		ST JOHNS CO ANASTASIA ISLAND WWTF UV DISINFECTION IMPROVEMENTS			
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:	
\$1,699,700	(original)	May 2022		Wastewater	
\$1,699,700	(current)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Constantine		SGS Contracting Services, Inc.		St. Johns County	
Dave Rasmussen				Teri Penson	
DESCRIPTION:					
				Modification to existing chlorine contact chamber for the installation of UV disinfection equipment. Includes structural improvements, Metal building, electrical and SCADA improvements.	
TITLE:		CITY OF ORMOND BEACH WRF CHLORINE CONTACT CHAMBER MODIFICATIONS			
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:	
\$707,700	(original)	February 2022		Wastewater	
\$707,700	(current)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mead & Hunt		SGS Contracting Services, Inc.		City of Ormond Beach (FL)	
Brad Blais				Al Waitt	
DESCRIPTION:					
				Modification to existing chlorine contact chamber for the installation of new concrete baffle walls. Includes control strategy changes, along with electrical modifications.	

TITLE:		CITY OF DELAND WILEY NASH WRF DIGESTER UPGRADES & IMPROVEMENTS				
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:		
\$1,656,700	(original)	May 2022		Wastewater		
\$1,656,700	(current)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:		
Mead & Hunt		SGS Contracting Services, Inc.		City of DeLand		
Cassandra Cissell				Jim Ailes		
DESCRIPTION:						
Remove and replace existing aeration systems in existing digesters. Includes new blower facility with three (3) blowers, VFD, controls and significant electrical upgrades.						
TITLE:		CITY OF HIGH SPRINGS POTABLE WELL #3				
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:		
\$664,700	(original)	April 2022		Water		
\$664,700	(current)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:		
Saltus Engineering		SGS Contracting Services, Inc.		City of High Springs		
David Bolam				Bruce Gillingham		
DESCRIPTION:						
Construction of new potable water production well, associated piping, controls, and electrical						
TITLE:		ELLSVILLE WWTP EXPANSION				
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:		
\$1,047,700	(original)	October 2022		Wastewater		
\$1,047,700	(current)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:		
Arcadis		SGS Contracting Services, Inc.		Columbia County		
Sean Chapparo				Chad Williams		
DESCRIPTION:						
Improvements to several areas of the facility, including dewatering belt press, pump stations, aeration improvements, blowers, grit system, electrical, and controls. Also includes significant building renovations.						
TITLE:		CITY OF MADISON WWTP IMPROVEMENTS				
CONTRACT VALUE:		SCHEDULED COMPLETION:		SERVICE:		
\$2,787,700	(original)	December 2022		Wastewater		
\$2,787,700	(current)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:		
Saltus Engineering		SGS Contracting Services, Inc.		City of Madison		
David Bolam				Contact TBD		
DESCRIPTION:						
Improvements to several areas of the facility, including dewatering belt press, pump stations, aeration improvements, blowers, grit system, electrical, and controls. Also includes significant building renovations.						

SGS CONTRACTING SERVICES, INC.

PROJECT HISTORY

COMPLETED PROJECTS

(in order of most recent, truncated past 5 years)

TITLE: TOWN OF WILLISTON WWTF PHASE 1 UPGRADE			
CONTRACT VALUE:		SCHEDULED COMPLETION:	
\$641,700 (original)		October 2021	
\$641,700 (current)			
CONSULTANT:		GENERAL CONTRACTOR:	
Wright-Pierce		SGS Contracting Services, Inc.	
Bart Booz			
OWNER:		Town of Williston	
DESCRIPTION:			
Clarifier rehabilitation, rotor ditch rehab, screening rehab, and misc. electrical improvements.			
TITLE: CITY OF ORMOND BEACH WTP LIME SLUDGE DEWATERING IMPROVEMENTS			
CONTRACT VALUE:		SCHEDULED COMPLETION:	
\$1,048,700 (original)		June 2021	
\$624,700 (final)			
CONSULTANT:		GENERAL CONTRACTOR:	
McKim & Creed		SGS Contracting Services, Inc.	
Scott Spooner			
OWNER:		City of Ormond Beach (FL)	
		Lynn Carter	
DESCRIPTION:			
Replacement of existing lime sludge dewatering centrifuge, including misc. modifications to existing piping systems and structural building members. Includes extensive electrical and integration work. Deductive Change Order issued for ODP of major equipment.			
TITLE: FALKENBURG AWTP BAR SCREEN REPLACEMENT			
CONTRACT VALUE:		SCHEDULED COMPLETION:	
\$2,588,700 (original)		July 2021	
\$2,741,028 (final)			
CONSULTANT:		GENERAL CONTRACTOR:	
Brown & Caldwell		SGS Contracting Services, Inc.	
OWNER:		Hillsborough County	
		Jim Huntsberger	
DESCRIPTION:			
Replacement of bar screens and related equipment, including washers, compactors and conveyance. Includes significant electrical and integration/controls upgrades			
TITLE: EUSTIS ARDICE WTP IMPROVEMENTS			
CONTRACT VALUE:		COMPLETION DATE:	
\$1,387,700 (original)		March 2021	
\$1,414,821 (final)			
CONSULTANT:		GENERAL CONTRACTOR:	
Wright-Pierce		SGS Contracting Services, Inc.	
Bart Booz			
OWNER:		City of Eustis	
		Daniel Milfan	
DESCRIPTION:			
Misc. improvements to existing WTP, including demolition of existing elevated storage tank, construction of new prestressed ground storage tank, high service pump, hydro tank, sitework, piping, electrical and controls.			
TITLE: FGUA FAIRWAYS AT MT. PLYMOUTH WWTP REPLACEMENT			
CONTRACT VALUE:		COMPLETION DATE:	
\$1,407,700 (original)		November 2020	
\$1,337,203 (final)			
CONSULTANT:		GENERAL CONTRACTOR:	
Kimley-Horn		SGS Contracting Services, Inc.	
Steve Romano			
OWNER:		FGUA	
		David Huff	
DESCRIPTION:			
Demolition of existing wastewater plant and construction of new wastewater plant. New plant is Mack Concrete package WWTP. Includes all components common to such facilities.			
TITLE: PORT ORANGE WRF BAR SCREEN REPLACEMENT			
CONTRACT VALUE:		COMPLETION DATE:	
\$544,700 (original)		January 2021	
\$544,700 (final)			
CONSULTANT:		GENERAL CONTRACTOR:	
Mead & Hunt		SGS Contracting Services, Inc.	
Brad Blais; 386-761-6810			
OWNER:		City of Port Orange	
		Steve Parnell	
DESCRIPTION:			
Replacement of existing mechanical bar screens and access stairs. Includes electrical and instrumentation.			

TITLE:		CITY OF FLAGLER BEACH WTP ELECTRICAL BUILDING			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$473,700 (original)		September 2020		Water	
\$473,700 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mead & Hunt		SGS Contracting Services, Inc.		City of Flagler Beach	
Kevin Lee; 386-761-6810					
DESCRIPTION:					
		Installation of new electrical building, including new gear, controls, and misc. yard piping.			
TITLE:		NASSAU-AMELIA WWTF CLARIFIER REHAB PROJECT			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$797,700 (original)		September 2020		Wastewater	
\$827,600 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
GAI Consultants		SGS Contracting Services, Inc.		Nassau County	
Jay Ameno					
DESCRIPTION:					
		Complete rehabilitation of two (2) existing clarifiers, including new process equipment, coatings, and aluminum walkways.			
TITLE:		CITY OF ORMOND BEACH WWTP SLUDGE DEWATERING UPGRADES & RE-AERATION BASIN IMPROVEMENTS			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$1,629,700 (original)		June 2020		Wastewater	
\$1,629,700 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mead & Hunt		SGS Contracting Services, Inc.		City of Ormond Beach	
Brad Blais; 386-761-6810				Lynn Carter	
DESCRIPTION:					
		Replacement of 2 existing centrifuges, sludge grinders, polymer feed equipment and related systems. Includes modifications to existing Re-aeration basins, including major bypass and diffuser installation. Installation of new aluminum walkways.			
TITLE:		MARION COUNTY ASHLEY FARMS WTP WELL			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$449,700 (original)		July 2020		Water	
\$449,700 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Kimley Horn		SGS Contracting Services, Inc.		Marion County	
Lewis Bryant				Jeff Lanphere	
DESCRIPTION:					
		Misc. modification to existing WTP, including electrical, controls, new well and associated piping.			
TITLE:		MARION COUNTY OAK RUN WWTF ODOR CONTROL IMPROVEMENTS			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$1,286,700 (original)		May 2020		Wastewater	
\$1,256,366 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Pigeon - Roberts & Associates		SGS Contracting Services, Inc.		Marion County	
Chuck Pigeon				Jeff Lanphere	
DESCRIPTION:					
		Installation of new odor control system including basin and headworks covers. Also includes major coating rehab, structural metals, Piping, electrical and instrumentation.			
TITLE:		MWSRF SODIUM BISULFITE EXPANSION & MISC. DRAINAGE IMPROVEMENTS			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$370,097 (original)		April 2020		Wastewater	
\$370,097 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Kimley Horn		Wharton-Smith		Gainesville Regional utilities (GRU)	
		Carlin Dunlap, 321-318-7976			
DESCRIPTION:					
		Expansion of existing sodium bisulfite system, including new pumps, tank, pipe systems and misc. drainage improvements around the Site. Also includes chlorine contact chamber expansion and new handrail on entire perimeter of structure.			

TITLE: ZELLWOOD RD WATER SYSTEM IMPROVEMENTS PART A WTP NO.1 & NO.2					
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$2,740,000 (original)		May 2020		Water	
Pending (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mittauer & Associates		SGS Contracting Services, Inc.		Zellwood Water Users, Inc.	
Kellen Lindsey; 904-278-0030					
DESCRIPTION:					
Upgrades and expansion to existing water treatment plants for the Zellwood Water Users, including construction of new administration Building, storage tanks, generators, wells, electrical, controls.					
TITLE: BIOSOLIDS CONVEYOR SYSTEM FOR OAK RUN WWTF, SILVER SPRINGS SHORES & STONECREST WWTF'S					
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$419,700 (original)		March 2020		Wastewater	
\$419,700 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Pigeon - Roberts & Associates		SGS Contracting Services, Inc.		Marion County	
Chuck Pigeon				Jeff Lanphere	
DESCRIPTION:					
Installation of biosolids conveyors at 3 facilities for use with mobile centrifuge unit.					
TITLE: ST JOHNS COUNTY SR16 WWTF FILTER IMPROVEMENTS					
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$776,500 (original)		November 2019		Wastewater	
\$775,556 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Constantine Engineering		SGS Contracting Services, Inc.		St Johns County Utilities	
Dave Rasmussen				Teri Pinson; 904-209-2604	
DESCRIPTION:					
Construction of new cloth media filter system, including underground piping, electrical, and controls.					
TITLE: CITY OF WILDWOOD WWTF PLC UPGRADES & ATS ADDITION					
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$938,700 (original)		November 2019		Wastewater	
\$938,700 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Kimley Horn		SGS Contracting Services, Inc.		City of Wildwood	
Trey Cleyton; 352-438-3000					
DESCRIPTION:					
Installation of new plant controls, electrical building and generator ATS.					
TITLE: CITY OF DAYTONA BEACH BRENNAN WTP LIME SOLIDS CONTACT CLARIFIERS 1-3 REHAB					
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$788,000 (original)		November 2019		Water	
\$788,000 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
N/A		SGS Contracting Services, Inc.		City of Daytona Beach	
		Working under a direct PO from Ovivo Water LLC			
DESCRIPTION:					
Rehabilitation of three (3) lime solids, contact clarifiers, consisting of full sandblasting and high performance coatings and as needed Structural repairs.					
TITLE: ST JOHNS RIVER INTAKE & FILTRATION					
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$1,748,000 (original)		July 2019		Wastewater	
\$857,130 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mead & Hunt		SGS Contracting Services, Inc.		City of DeLand	
Brad Blais; 386-761-6810					
DESCRIPTION:					
Demolition of existing sand filter and installation of new AquaDiamnod filter system. Also includes installation of new bar screen, misc. Pumps and other improvements at the facility.					

TITLE:		CITY OF CASSELBERRY NORTH WTP HIGH SERVICE PUMP REPLACEMENT		
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:
\$482,000	(original)	June 2019		Water
\$482,000	(final)			
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:
Kimley-Horn		SGS Contracting Services, Inc.		City of Casselberry Tara Lamoureux; 407-262-7725
DESCRIPTION:				
Replacement of existing high-service pumps, electrical, and controls.				
TITLE:		CITY OF DUNEDIN AWTP DENITRIFICATION FILTER REHAB		
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:
\$697,400	(original)	May 2019		Wastewater
\$697,400	(final)			
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:
King Engineering Loc Truong; 813-880-8881		SGS Contracting Services, Inc.		City of Dunedin
DESCRIPTION:				
Replacement of all pneumatically and electrically operated filter control valves (20 total), including the installation of eight (8) line stops in lower-building level upper piping. Valves range from 20" to 10"				
TITLE:		HALIFAX PLANTATION WWTP REHAB		
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:
\$906,000	(original)	May 2019		Wastewater
\$906,000	(final)			
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:
Mead & Hunt Brad Blais; 386-761-6810		SGS Contracting Services, Inc.		Volusia County
DESCRIPTION:				
Rehabilitation of two (2) existing package wastewater treatment plants to include significant structural repairs, piping replacements, Handrail and grating replacement, gear drive replacement, new RAS pump station, electrical and controls.				
TITLE:		CHIEFLAND WWTP BIOSOLIDS DIGESTER		
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:
\$735,000	(original)	April 2019		Wastewater
\$735,000	(final)			
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:
Mills Engineering Andrew Carswell; 352-486-2872		SGS Contracting Services, Inc.		City of Chiefland
DESCRIPTION:				
Construction of new CIP digester, plus accessory pumps and jet aeration system.				
TITLE:		LAKE BUTLER WWTP & RECREATION IMPROVEMENTS		
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:
\$325,350	(original)	April 2019		Wastewater
\$325,350	(final)			
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:
ATM		SGS Contracting Services, Inc.		Town of Lake Butler
DESCRIPTION:				
Replacement of misc. equipment and the wastewater plant, including pumps, blowers and aeration piping systems. Also includes installation of public recreation equipment.				
TITLE:		UNIVERSITY OF FLORIDA WWTP BIOSOLIDS IMPROVEMENTS		
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:
\$1,006,585	(original)	May 2019		Wastewater
\$1,025,526	(final)			
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:
Hazen & Sawyer		The Brentwood Company		University of Florida
DESCRIPTION:				
Demolition and removal of existing belt press sludge dewatering equipment and replacement with one (1) new centrifuge for Biosolids thickening. Includes structural concrete, aluminum structures, and heavy process mechanical piping.				

TITLE:	TOWN OF BRANFORD WWTP EFFLUENT STORAGE TANK				
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$667,000 (original)				Potable Water	
\$688,676 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Florida Rural Water Association				Town of Branford	
				Robbie Lee	
DESCRIPTION:	Installation of new glass-fused-to-steel ground storage tank, effluent pump station, misc. pumps and piping, and electrical. Includes Structural grouting beneath tank foundation. Rehab of existing spray field.				
TITLE:	WILDWOOD CR-501 WTP IMPROVEMENTS				
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$382,000 (original)		February 2019		Water	
\$382,000 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Kimley-Horn		SGS Contracting Services, Inc.		City of Wildwood	
Trey Cleyton; 352-438-3000					
DESCRIPTION:	Misc. improvements, including installation of new well pumps/motors, underground piping, concrete structures, electrical and Controls improvements.				
TITLE:	LEESBURG TURNPIKE WWTF DEWATERING IMPROVEMENTS				
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$1,487,000 (original)		January 2019		Wastewater	
\$1,487,000 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Jones Edmunds & Associates		SGS Contracting Services, Inc.		City of Leesburg	
DESCRIPTION:	Installation of new belt press dewatering facility, including new process equipment, piping, aluminum structures, metal building, Structural concrete and electrical.				
TITLE:	ST JOHNS COUNTY A1A BOOSTER PUMP STATION & GST				
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$1,613,500 (original)		January 2019		Water	
\$1,613,500 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Mott-McDonald		SGS Contracting Services, Inc.		St Johns County Utilities	
				Teri Pinson; 904-209-2604	
DESCRIPTION:	Construction of new booster pump station, including clearing/grubbing, cast-in-place GST, pump station building, high service pumps. Piping, electrical and T & C.				
TITLE:	IRISH ACRES WTP (MARION COUNTY)				
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$1,874,970 (original)		January 2019		Water	
\$1,861,567 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Tillman & Associates		SGS Contracting Services, Inc.		Marion County Utilities	
				Jeff Lanphere	
DESCRIPTION:	Expansion of existing WTP, including prestressed storage tank, high service pumps, electrical and pumps buildings, generator yard piping, Instrumentation and electrical.				
TITLE:	FLAGLER BEACH WWTP PHASE II IMPROVEMENTS				
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$794,347 (original)		May 2018		Wastewater	
\$808,635 (final)					
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Quentin L Hampton & Assoc Kevin Lee; 386-761-6810		SGS Contracting Services, Inc.		City of Flagler Beach	
DESCRIPTION:	Misc. improvements throughout WWTP facility, including chlorine contact chamber expansion, partial clarifier rehab, installation of Pumps and piping, misc. metals and electrical. Included structural modifications to existing oxidation ditches.				

TITLE:		ORANGE COUNTY NWWRF ODOR CONTROL REPLACEMENT			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$606,500	(original)	December 2017		Wastewater	
\$606,500	(final)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Black & Veatch		SGS Contracting Services, Inc.		Orange County	
				Terra Reffitt; 407-947-9802	
DESCRIPTION:		Demolition of existing odor control facilities and installation of new bio-tricking odor control system, including piping, pipe supports, Ductwork, structural concrete, electrical and instrumentation improvements.			
TITLE:		NASSAU-AMELIA WWTF HEADWORKS & AERATION PIPING REHABILITATION			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$616,212	(original)	November 2017		Wastewater	
\$891,049	(final)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
GAI Consultants		SGS Contracting Services, Inc.		Nassau County (FL)	
Scott Richards; 904-363-1110				Becky Hiers-Bray; 904-530-6225	
DESCRIPTION:		Replace existing rotary drum screen, associated support structure, and complete replacement of above-grade aeration piping and valves.			
TITLE:		DADE CITY ORANGE VALLEY WATER FACILITY IMPROVEMENTS			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$559,000	(original)	November 2017		Water	
\$574,236	(final)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Infrastructure Solutions		SGS Contracting Services, Inc.		City of Dade City	
Stephen Bucwinkel; 321-622-4646					
DESCRIPTION:		Misc. modifications and improvements to existing water supply facility, including new pumps, tank modifications, chemical feed system, Structural concrete, electrical and I & C modifications.			
TITLE:		ABURDALE/POLYTECHNIC RW GST & PUMP STATION			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$535,000	(original)	July 2017		Reclaimed Water	
\$535,000	(final)				
CONSULTANT:		GENERAL CONTRACTOR:		OWNER:	
Chastain-Skillman		Crom Corp		City of Auburndale	
		James Wornick; 352-372-3436			
DESCRIPTION:		Provide all site work and pipe installation for the new 2.0MG tank, constructed by Crom Corp. includes installation of new high service Pump station, with misc. improvements to electrical and I & C systems (Project date extended for specialty coating requirements)			
TITLE:		ST PETE NEWRF CLARIFIER #4 REHAB			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$432,231	(original)	January 2017		Wastewater	
\$432,231	(final)				
TITLE:		CITY OF BARTOW CENTRIFUGE INSTALLATION PROJECT			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$802,411	(original)	August 2016		Wastewater	
\$802,411	(final)				
TITLE:		WINTER GARDEN WOODLARK WTP 1.0MG TANK PROJECT			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$543,546	(original)	July 2016		Water	
\$543,546	(final)				
TITLE:		RIVERSIDE LIFT STATION REHAB & ODOR CONTROL PROJECT			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$444,054	(original)	July 2016		Wastewater	
\$540,083	(final)				
TITLE:		GRU LS 6 ODOR CONTROL PROJECT			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$179,559	(original)	January 2016		Wastewater	
\$179,559	(final)				
TITLE:		DAYSRING HEALTH WTP			
CONTRACT VALUE:		COMPLETION DATE:		SERVICE:	
\$344,000	(original)	January 2016		Water	
\$344,000	(final)				

State of Florida

Department of State

I certify from the records of this office that SGS CONTRACTING SERVICES, INC. is a corporation organized under the laws of the State of Florida, filed on October 8, 2012, effective July 25, 2007.

The document number of this corporation is P12000085304.

I further certify that said corporation has paid all fees due this office through December 31, 2021 and that its status is active.

I further certify that said corporation has not filed Articles of Dissolution.

*Given under my hand and the
Great Seal of the State of Florida
at Tallahassee, the Capital, this
the Twenty-seventh day of
January, 2021*

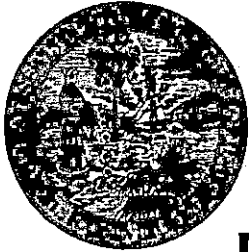


Ronald R. DeSantis
Secretary of State

Tracking Number: 0895705452CC

To authenticate this certificate, visit the following site, enter this number, and then follow the instructions displayed.

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Ron DeSantis, Governor

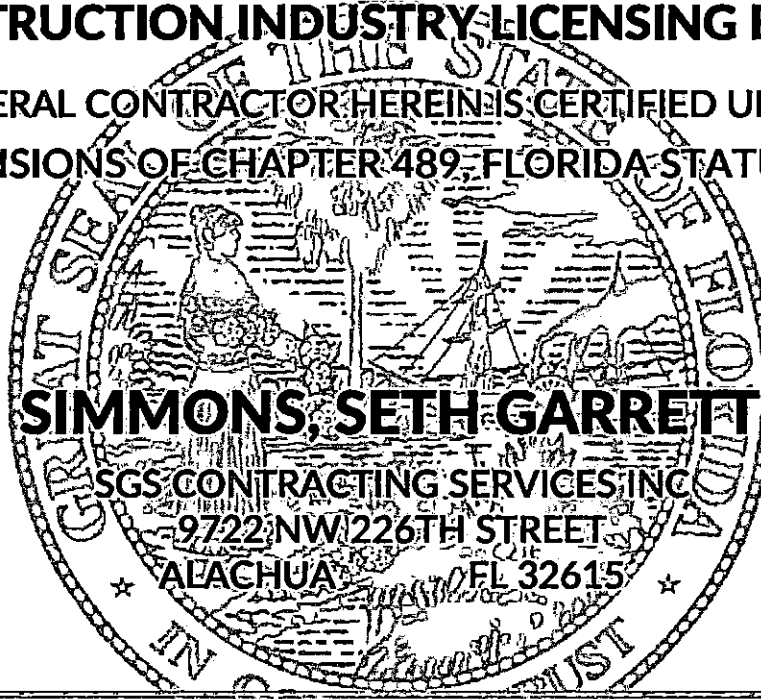
Halsey Beshears, Secretary



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES



SIMMONS, SETH GARRETT

SGS CONTRACTING SERVICES INC

9722 NW 226TH STREET

ALACHUA FL 32615

LICENSE NUMBER: CGC1514772

EXPIRATION DATE: AUGUST 31, 2022

Always verify licenses online at MyFloridaLicense.com



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Ron DeSantis, Governor

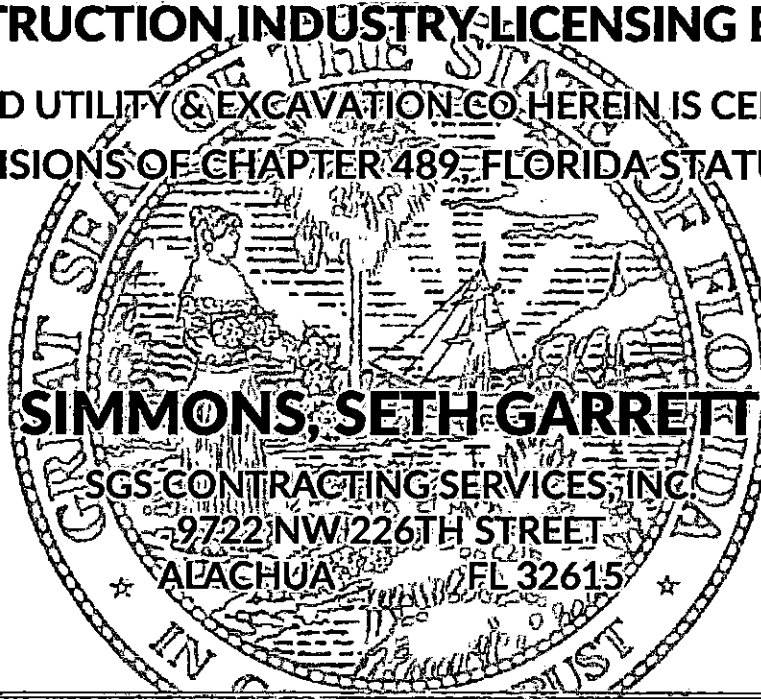
Halsey Beshears, Secretary



**STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION**

CONSTRUCTION INDUSTRY LICENSING BOARD

THE UNDERGROUND UTILITY & EXCAVATION CO. HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES



SIMMONS, SETH GARRETT

SGS CONTRACTING SERVICES, INC

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Office: PO Box 908 – High Springs, FL 32655

Phone: (386) 361-5300

CGC 1514772 / CUC 1225090

STATEMENT REGARDING PAST CONTRACT TERMINATION

We at SGS Contracting Services, Inc. pride ourselves in the successful completion of all projects, including those in which adversity is presented. However, we acknowledge that the Project Owner may at any time, due to no fault of the Contractor, determine that cancellation of the contract for convenience is in their best interest. The information presented below is descriptive of any such events experienced by our firm.

PROJECT: Cow Path Master Pump Station (Pasco County, FL)

DATE(S): September 2019 (terminated for convenience)

DESCRIPTION:

While excavating at an approximate depth of 25' BLS for the construction of a designed cast-in-place wet-well bottom slab, we encountered a confined artesian aquifer condition, which was unexpected by all parties. Subsequent geotechnical investigations confirmed the condition, and the EOR determined that alternate designs and construction methods would likely be required. As a result, the County elected to terminate our contract for convenience and complete the project at a later date. Due to the nature of the issue, there were no bond claims or implications, nor were any legal measures required. All matters pertaining to the termination were amicable between our firm and Pasco County.



St. Johns County Board of County Commissioners

Purchasing Division

December 6, 2021

ADDENDUM #1

To: Prospective Bidders
From: St. Johns County Purchasing Department
Subject: Bid No. 22-34 Northwest No. 7 Wellhead and Site Improvements

This Addendum #1 is issued for further respondent's information and is hereby incorporated into the Bid documents. Each respondent will ascertain before submitting a proposal that he/she has received all Addenda. Please return an original copy of this signed Addendum with your proposal to the St. Johns County Purchasing Department, David E. Pyle, CPPB; 500 San Sebastian View; St. Augustine, FL 32084.

Change: Minimum Qualification of Contractors – replace paragraph one (1) with the following:

Prime bidder must be fully licensed to do business in the State of Florida and hold a valid Certified General Contractor's License or a valid certified Underground Utility License at the time the bid is due. Bidders must have successfully completed, as a Prime Contractor, at least three (3) projects, in the past five (5) years, of similar type, size and dollar value of the project described herein. One or more of these three (3) projects must include the installation of 12" and larger flanged and mechanical joint pipe, fittings, and valves, and a generator in a remote setting. The dollar value of similar projects must be at least 75% of the submitted bid. St. Johns County reserves the right to request additional information regarding qualifications and to use this information for the purpose of awarding a contract.

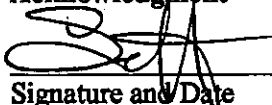
Questions/Answers:

1. Will the County allow a Certified Underground Utility Contractor to bid this project as well?

Answer: Yes; refer to the Change in the Minimum Qualification of Contractors above.

THE BID DUE DATE IS UNCHANGED: Wednesday, December 15, 2021 AT 2:00 P.M.

Acknowledgment

 12/15/21
Signature and Date

Seth Simmons / President
Printed Name/Title

SGS Contracting Services, Inc.
Company Name (Print)

Sincerely,

David E. Pyle, CPPB
Procurement Coordinator

END OF ADDENDUM NO. 1

BID NO: 22-34

BID BOND

STATE OF FLORIDA
COUNTY OF ST. JOHNS

KNOW ALL MEN BY THESE PRESENTS, that SGS Contracting Services, Inc. as Principal, and Atlantic Specialty Insurance Company as Surety, are held and firmly bound unto St. Johns County, Florida, in the penal sum of ----- Five Percent of Amount Bid ----- Dollars (\$--- 5% ---) lawful money of the United States, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATIONS IS SUCH that whereas the Principal has submitted the accompanying Bid, dated December 15th, 2021.

For
Northwest Well No. 7 Wellhead and Site Improvements, St. Johns County, Florida

NOW THEREFORE,

- (a) If the Principal shall not withdraw said Bid within ninety (90) days after Bid Award date, and shall within ten (10) days after prescribed forms are presented to him for signature, enter into a written Contract with the County in accordance with the Bid as accepted, and give Bond with good and sufficient Surety or Sureties, as may be required, for the faithful performance and proper fulfillment of such Contract, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.
- (b) In the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such Bond within the time specified, if the Principal shall pay the County the difference between the amount specified, in said Bid and the amount for which the County may procure the required Work and supplies, if the latter amount be in excess of the former, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals, this 15th day of December A.D., 2021, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

BID NO: 22-34

WITNESSES:

(If Sole Ownership or Partnership two (2) Witnesses required).
(If Corporation, Secretary only will attest and affix seal).

WITNESSES:
[Signature]

[Signature]

SGS Contracting Services, Inc.

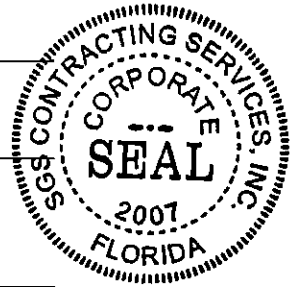
PRINCIPAL:

SGS Contracting Services, Inc.

NAME OF FIRM:

[Signature]

SIGNATURE OF AUTHORIZED OFFICER (AFFIX SEAL)



Seth G. Simmons, President

TITLE

18420 High Springs Main Street

BUSINESS ADDRESS

High Springs, FL 32643

CITY

STATE

Atlantic Specialty Insurance Company

SURETY:

Atlantic Specialty Insurance Company

CORPORATE SURETY

[Signature]

Jorge L. Bracamonte, Attorney-In-Fact & Florida Licensed Resident Agent

605 Highway 169 North, Suite 800

BUSINESS ADDRESS

Plymouth, MN 55441

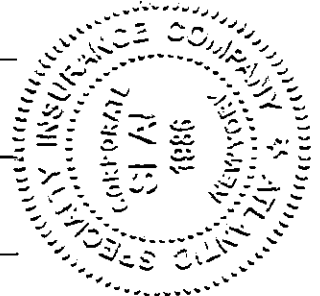
CITY

STATE

JCA Surety Group, LLC

123 Zelma Street, Suite A Orlando, FL 32803

NAME OF LOCAL INSURANCE AGENCY



WITNESS:

Karla Tomaszewski
Karla Tomaszewski

Inquiries: (321) 800-6594



Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Jorge L. Bracamonte, Jessie Sloan**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **unlimited** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

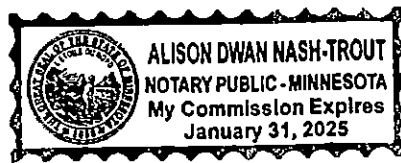
IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-seventh day of April, 2020.



By *Paul J. Brehm*
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this twenty-seventh day of April, 2020, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.



Alison Nash-Trout
Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 15th day of December, 2021.

This Power of Attorney expires
January 31, 2025



Kara Barrow
Kara Barrow, Secretary



Atlantic Specialty Insurance Company
Period Ended 12/31/2020

Dollars displayed in thousands

Admitted Assets		Liabilities and Surplus	
Investments:		Liabilities	
Bonds	\$ 1,500,023	Loss Reserves	\$ 878,884
Preferred Stocks	-	Loss Adjustment Expense Reserves	<u>272,666</u>
Common Stocks	775,825	Total Loss & LAE Reserves	1,151,550
Mortgage Loans	-		
Real Estate	-	Unearned Premium Reserve	593,461
Contract Loans	-	Total Reinsurance Liabilities	13,171
Derivatives	-	Commissions, Other Expenses, and Taxes due	54,583
Cash, Cash Equivalents & Short Term Investments	147,406	Derivatives	-
Other Investments	<u>23,375</u>	Payable to Parent, Subs or Affiliates	-
Total Cash & Investments	2,446,629	All Other Liabilities	<u>237,942</u>
		Total Liabilities	<u>2,050,707</u>
Premiums and Considerations Due	276,120		
Reinsurance Recoverable	59,375	Capital and Surplus	
Receivable from Parent, Subsidiary or Affiliates	29,538	Common Capital Stock	9,001
All Other Admitted Assets	<u>62,330</u>	Preferred Capital Stock	-
Total Admitted Assets	<u>2,873,992</u>	Surplus Notes	-
		Unassigned Surplus	91,944
		Other Including Gross Contributed	<u>722,341</u>
		Capital & Surplus	823,286
		Total Liabilities and C&S	<u>2,873,992</u>

State of Minnesota
County of Hennepin

I, Kara Barrow, Secretary of Atlantic Specialty Insurance Company do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company, on the 31st day of December, 2020, according to the best of my information, knowledge and belief.

Secretary

Subscribed and sworn to, before me, a Notary Public of the State of Minnesota on this 2nd day of March, 2021.

Notary Public





**Board of County Commissioners
St. Johns County, Florida**

BID NO: 22-34

**NORTHWEST WELL NO. 7
WELLHEAD AND SITE IMPROVEMENTS**

**BID DOCUMENTS
PROJECT SPECIFICATIONS**

**St. Johns County Purchasing Division
500 San Sebastian View
St. Augustine FL 32084
904.209.0150
www.sjcfl.us/Purchasing/index.aspx**

Final 11/1/21

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**FRONT END
BID DOCUMENTS**

INSTRUCTION TO BIDDERS

OWNER: The Board of County Commissioners of St. Johns County, Florida (“County”) OR (“Owner”)

PROJECT: BID NO.: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements

DEFINITIONS

All definitions set forth in the General Conditions of the Contract or in other Contract Documents are applicable to the Bidding Documents.

Addenda are written or graphic instruments issued by the Purchasing Department prior to the time and date for receiving Bids that modify or interpret the Bidding Documents by addition, deletion, clarification, or corrections.

Base Bid is complete and properly signed proposal to do the work, or designated portion thereof, for the sums stipulated therein supported by data called for by the Bidding Documents.

Bid An offer, as a price, whether for payment or acceptance. A quotation, specifically given to a prospective purchaser upon its request, usually in competition with other vendors

Bid (Formal or Sealed) A request for firm prices by Advertised Legal Notice. Prices are submitted in sealed envelopes and in conformance with a prescribed format, all of which are opened in public on an appointed hour and date as advertised.

Bid Bond A good faith monetary commitment which a bidder or surety forfeits to the County of the bidder refuses, or is unable to enter into a contract after submitting a bid, or the bidder cannot furnish the required bonds, usually five percent (5%) of the bid proposal price.

Bidder is a firm or individual who submits a Bid to the Owner for the work described in the proposed Contract Documents.

Bid Documents include the Advertisement/Notice to Bidders, Front End Bid Documents, Contract Forms and Conditions, Specifications and Plans including any Addenda issued prior to receipt of Bids.

Contract A delivered agreement between two or more parties, legally binding and enforceable, to perform a specific act or acts or exchange goods for consideration. A purchase order becomes a contract when accepted by a vendor. A unilateral contract is one in which only one party promises performance. A bilateral contract is one in which both parties promise performance.

Contractor An individual or firm having a contract to provide goods, service or construction for a specified price

County St. Johns County, a political subdivision of the State of Florida (F.S. 217.73)

Experience Modification Rate (EMR) Number used by insurance companies to gauge both past cost of injuries and future chances of risk.

Responsible Bidder A bidder capable of performing in all respects to fulfill the contract requirements. This includes having the ability to perform, the experience, reliability, capacity, credit, facilities and equipment to meet the contractual obligation.

Responsive Bid, Responsive Proposal, or Responsive Reply A bid, proposal, or reply submitted by a responsive and responsible vendor conforming in all material respects to the solicitation.

Specifications A clear, complete and accurate statement of the physical, functional or technical requirements descriptive of an item and if applicable, the procedure to be followed to determine if the requirements are met.

Subcontractor A party who contracts with a prime contractor to perform all or any part of the prime contractor's obligations.

Unit Price is an amount stated in the Bid as a price per unit of measurement for materials or services as described in the contract documents which shall include all labor, materials, equipment and any other item/s essential to accomplish the scope of work of the Unit Price.

BIDDER'S REPRESENTATION

Each Bidder, by marking his Bid, represents that he has read and understands the Bid and Contract Documents and his Bid is made in accordance herewith: he has visited the Site and has familiarized himself with the local conditions under which the Work is to be performed; and his Bid is based upon the materials, systems and equipment described in the Bid Documents without exceptions.

BID DOCUMENTS

Bid Documents may be obtained from www.demandstar.com as stated in the Advertisement or Invitation - Notice to Bidders. Complete sets of Bid Documents shall be used in preparing the Bid Proposal. St. Johns County shall not assume any responsibility for errors or misinterpretations resulting from the use of complete or incomplete sets of Bid Documents. The Owner, in making copies of the Bid Documents available on the above terms, do so only for the purpose of obtaining bids on the Work and do not confer a license or grant for any other use.

INTERPRETATION OR CORRECTION OF BID DOCUMENTS

Bidders shall promptly notify the Owner of any ambiguity, inconsistency, or error which they may discover upon examination of the Bid Documents or of the site and local conditions. Bidders requiring clarification of interpretation of the Bid Documents shall make a written request to the Owner, to reach him at least **fourteen (14) calendar days** prior to the date for receipt of Bids.

An interpretation, correction, or change of the Bid Documents will be made by Addendum. Interpretation, corrections, or changes of the Bid Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretation, corrections, and change. No change will be made to the Bid Documents by the Owner or its Representative **seven (7) days** prior to Bid receiving date, however, the Owner reserves the authority to decrease this time depending on the necessity of such change.

SUBSTITUTIONS

The materials, products and equipment described in the Bid Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitution will be considered unless written request for approval has been submitted by the Bidder and has been received by the Owner at least **fourteen (14) calendar days** prior to the date for receipt of Bids. Each such request shall meet the requirements of the Supplementary Conditions and include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute, including drawings, cuts, performance and test data any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. The project director's approval or disapproval of a proposed substitution shall be final.

If County Staff approves any proposed substitution, such approval will be set forth in an Addendum. Bidders shall **not** rely upon approval made in any other manner.

PRE-BID MEETING

A **NON-MANDATORY Pre-Bid Meeting** will be held on **Tuesday, November 16, 2021 at 9:00 AM EDST** at the St. Johns County Utility Department, 1205 State Road 16, St. Augustine, FL 32084. Attendance for prime bidders at the Pre-Bid Meeting is highly recommended. **Please do not park in designated customer service parking spots.**

DESIGNATED POINT OF CONTACT

The County's Designated Point of Contact for this Bid is David E. Pyle, CPPB, Procurement Coordinator, St. Johns County, FL. Any and all questions and/or inquiries shall be directed, *in writing*, via email to dpyle@sjcfl.us. In the event the Designated Point of Contact is absent or otherwise unavailable for more than three (3) business days, firms may contact Leigh A. Daniels, CPPB, Purchasing Manager at ldaniels@sjcfl.us.

Vendors shall not contact, lobby, or otherwise communicate with any SJC employee, including any member of the Board of County Commissioners, other than the above referenced individual from the point of advertisement of the Bid until contract(s) are executed by all parties, per SJC Purchasing Procedure Manual, Section 304.6.5 "Procedures Concerning Lobbying". According to SJC policy, any such communication shall disqualify the vendor, contractor, or consultant from responding to the subject invitation to bid, request for quote, request for proposal, invitation to negotiate, or request for qualifications. St. Johns County reserves the right to accept or reject any or all

bids/proposals, waive minor formalities, and to award the bid/proposal that best serves the interests of St. Johns County. St. Johns County also reserves the right to award the base bid and any alternate bids in any combination that best suits the needs of the County.

QUESTIONS

Any and all questions related to this solicitation shall be directed, *in writing*, to the County’s Designated Point of Contact. Questions are due no later than four o’clock (4:00PM EST) on **Wednesday, December 1, 2021**, so that any necessary addenda may be issued in a timely manner. Any questions received after the deadline will not be answered unless previously approved by the SJC Purchasing Manager or other designated County Representative. In the event the Designated Point of Contact is absent or otherwise unavailable for more than three (3) business days, bidders may contact Leigh A. Daniels, CPPB, Purchasing Manager at ldaniels@sjcfl.us.

ADDENDA

Addenda will be distributed to all who are known by the entity responsible for distribution of the complete set of Bid Documents. Copies of Addenda will be made available for inspection wherever Bid Documents are on file for that purpose.

Each Bidder shall ascertain prior to submitting a bid, that all issued addenda have been received, and each Bidder **shall** acknowledge receipt, of all issued addenda in the space provided in the Official County Bid Form, and a fully acknowledged copy of each issued addendum must be included in the submitted bid proposal. Failure to provide fully acknowledged copies of each addendum may result in a bid proposal being deemed non-responsive.

BID SUBMITTAL REQUIREMENTS

Bids shall be submitted in **TRIPLICATE (one (1) original and two (2) copies)** on the required forms provided herein and shall be submitted no later than **2:00 PM EST, Wednesday, December 15, 2021**. All blanks on the Bid Form shall be filled in by typewriter or manually in blue or black ink. Bidders are not required to submit a copy of this Bid Document with their bid proposals. The bidders are required to submit, at a minimum, the Bid Proposal Attachments listed in this Document.

Bid proposals must be placed in an envelope, sealed and placed in a second envelope or container, plainly marked on the outside addressed to St. Johns County Purchasing Division, with the bidder’s return address in top left-hand corner and recite: “**Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements**.”

See Example Below:

ABC Company, Inc. 123 Aviles Street St. Augustine, FL 32084	St. Johns County Purchasing Division 500 San Sebastian View St. Augustine, FL 32084 BID NO.: YY-XX - SEALED BID FOR PROJECT NAME
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At the end of this document, a sealed Bid mailing label is provided for convenience. Bidders shall affix the provided label to the outside of the sealed envelope/container to submit their Bid.

Bidder shall assume full responsibility for timely delivery at location designated for receipts of Bids. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids indicated in the Advertisement/Notice to Bidders, or any time extension thereof made by Addendum. Bids received after the time and date for receipt of Bids will be returned to the sender unopened.

Oral, telephonic, telegraphic or electronic Bids are invalid and will not receive consideration.

Where so indicated by the makeup of the Bid Form, sums shall be expressed in both words and figures, and in the case of discrepancy between the two, the amount expressed in words shall govern.

Any interlineations, alteration or erasure must be initialed by the signer of the Bid; failure to do so may cause the Bidder’s proposal to be considered non-responsive.

Bidder shall make no stipulation on the Bid Form nor qualify his Bid in any manner, to do so will classify the Bid as being non-responsive, and may result in the Bidder being removed from consideration for award.

Each submitted copy of the Bid Proposal shall include the full legal company name, address, telephone number and legal name of an authorized representative for the Bidder and a statement as to whether the Bidder is a sole proprietor, partnership, corporation, or any other legal entity. Each copy of the submitted Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporation seal affixed.

A Bid submitted by an agent shall have a current Power of Attorney attached certifying agent's authority to bind the Bidder.

BID SECURITY

Each submitted Bid shall be accompanied by a Bid Security, submitted on the Bid Bond Form provided herein, or in the form of a certified or cashier's check, in the amount of **five percent (5%) of the Total Bid Price** amount submitted on the Official County Bid Form, pledging that the Bidder will enter into a contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds as described hereunder covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds to the Owner, if required, the amount of the Bid Security shall be forfeited, not as penalty, but as liquidated damages.

A Bid Security in the form of a certified or cashier's check must be made payable to the Board of County Commissioners of St. Johns County. Bidders submitting a certified or cashier's check as the bid security are not required to submit **Attachment "B"** – Certificate as to Corporate Principal or the Bid Bond forms provided herein.

A Bid Security in the form of a Bid Bond shall be written on the form provided herein, with an acceptable surety, and the Attorney-in-Fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of his Power of Attorney. Acceptable surety companies are defined herein under "Surety Bond". The Surety Company shall be licensed to do business in the State of Florida and shall be listed by the U.S. Treasury Department. Any Bidder submitting a Bid Security in the form of a Bid Bond must also submit **Attachment "B"** – Certificate as to Corporate Principal.

The Owner shall have the right to retain the Bid Security of Bidders until either: (a) the Contract is executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.

BID BOND INSTRUCTIONS

If a Bidder chooses to submit a Bid Bond on the form provided herein, he must submit the bond as follows:

1. Prepare and submit one (1) original and two (2) copies of the required Bid Bond Forms as shown above
2. Type or print Bidder's and Surety's names in the same language as in the Advertisement, or Invitation to Bid.
3. Affix the Corporate Seal, and type or print the name of the Surety on the line provided and affix its corporate seal.
4. Attach a copy of Surety agent's Power of Attorney, unless the Power of Attorney has been recorded in St. Johns County. If it has been recorded, give the record book and page. If not recorded, the copy of the Power of Attorney must have an original signature of the Secretary or Assistant Secretary of Surety certifying the copy. The Surety's corporate seal must be affixed.

BID POSTPONEMENT/CANCELLATION

The County may, at its sole and absolute discretion, reject any bids that are not submitted in accordance with the terms in this Bid Solicitation. The County may re-advertise this Bid; postpone or cancel, at any time, this Bid process; or waive any irregularities in this Bid or in the proposals received as a result of this Bid.

LOCAL PREFERENCE

The County shall review all submitted bids to determine whether or not there is a Local Business within ten percent (10%) of the responsive, responsible low bid. If so, County shall verify all qualification requirements to validate the Vendor as a Local Business, in accordance with Section 302.25, SJC Purchasing Procedure Manual. If the lowest bid from a Local Business is responsive and the Bidder is responsible to perform the work, and the submitted bid is within ten percent (10%) of the low bid, the Local Bidder shall have forty eight (48) hours to agree, in writing, to match the low bid amount. If the Local Bidder agrees to match the low bid amount within the timeframe provided, the Local Bidder shall be awarded the bid, provided they meet any and all other requirements of the County. If the Local Bidder refuses, or fails to agree to match the low bid, the County shall consider the non-local low bid for award (see **Attachment "L"**).

In order to receive local preference consideration, vendor must qualify as a local business, and self-perform, or have perform by subcontractors that qualify as a local business, a minimum of fifty percent (50%) of all work. Fifty percent (50%) of all work must equal fifty percent (50%) of the contract price.

MODIFICATION OR WITHDRAWAL OF BID

A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and Bidder so agrees in submitting his Bid.

Prior to time and date designated for receipt of Bids, a Bid submitted early may be modified or withdrawn only by notice to the party receiving Bids at the place and prior to the time designated for receipt of Bids.

Such notice shall be in writing over the signature of the Bidder. If by telephone, written confirmation over the signature of Bidder must be mailed and postmarked on or before the date and time set for receipt of Bids; it shall be so worded as not to reveal the amount of the original Bid.

Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

Bid Security shall be in the amount of five percent (5%) of the Bid as modified or resubmitted.

COSTS INCURRED BY BIDDERS

All expenses involved with the preparation and submission of bids to the County, or any work performed in connection therewith, shall be borne by the Bidder(s). No rights of ownership will be conferred until title of the property is transferred to the successful bidder. All fees for copying and reproduction services for items listed herein are nonrefundable.

CONSIDERATION OF BIDS

Opening of Bids: Unless stated otherwise in an Addenda to the Advertisement/Notice to Bidders, the properly identified Bids received on time will be opened publicly as specified in the Advertisement and a tabulation of the bid amounts of the Base Bids and major Alternates, if any, will be made available to Bidders. The Bid Tabulation will be posted on the Purchasing Division bulletin board for seventy-two (72) hours.

Any bidder, proposer or person substantially and adversely affected by an intended decision or by an term, condition, procedure or specification with respect to any bid, invitation, solicitation of proposals or requests for qualifications, shall file with the Purchasing Division for St. Johns County, a written notice of intent to protest no later than seventy two (72) hours (excluding Saturdays, Sundays and legal holidays for employees of St. Johns County) after the posting either electronically or by other means of the notice of intended action, not of intended award, bid tabulation, publication by posting electronically or by other means of a procedure, specification, term or condition which the person intends to protest, or the right to protest such matter shall be waived. The protest procedures may be obtained from the Purchasing Division and are included in the St. Johns County Purchasing Procedure Manual. All of the terms and conditions of the St. Johns County Purchasing Procedure Manual are incorporated by reference and are fully binding.

Rejection of Bids: The Owner reserves the right to reject any or all Bids and in particular to reject a Bid not accompanied by any required Bid Security or data required by the Bid Documents or a Bid in any way incomplete or irregular.

Acceptance of Bid (Award): The Owner shall have the right to reject any or all Bids or waive any minor formality or irregularity in any Bid received.

The Owner shall have the right to accept alternates in any order or combination and to determine the low Bidder on the basis of the sum of the Base Bid and/or the Alternates accepted if alternate bids are requested in the Official County Bid Form.

It is the intent of the Owner to award a contract to the lowest responsible Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents, if judged to reasonable, and does not exceed the funds budgeted for the Project.

If the Contract is awarded, it will be awarded within a minimum of ninety (90) days from the date of the Bid opening, or as designated in the Bid Documents.

MINIMUM QUALIFICATION OF CONTRACTORS

Prime bidder must be fully licensed to do business in the State of Florida and hold a current Certified General Contractor's license at the time the bid is due. Bidders must have successfully completed, as a Prime or Sub-contractor, at least three (3) projects, in the past five (5) years, of similar type, size and dollar value of the project described herein. One or more of these three (3) projects must include the installation of wellhead, vertical turbine pump, 12" and larger flanged and mechanical joint pipe, fittings, and valves, and a generator in a remote setting. The dollar value of similar projects must be at least 75% of the submitted bid. St. Johns County reserves the right to request additional information regarding qualifications and to use this information for the purpose of awarding a contract.

Proof of qualifications shall be provided by completing and submitting **Attachment "H"** – Contractor's Qualifications Form and **Attachment "C"** – License/Certification List along with a copy of each license and certificate listed. All licenses, certifications and pre-qualifications must be valid and current on the date bids are submitted.

Bidders to whom award of a contract is under consideration shall submit to the County, upon request, a properly executed Contractor's Qualification Statement of AIA Document A305, unless such a statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

SUB-CONTRACTORS

Each Bidder shall submit to the County, a list of Subcontractors and major materials suppliers to be used if awarded the contract. A copy of the form, **Attachment "D"**, is provided in the Bidding Documents.

Upon request by the County, the successful Bidder shall within seven (7) days thereafter, submit all data required to establish to the satisfaction of the County, the reliability and responsibility of the proposed Subcontractors to furnish and perform the work described in the Sections of the Specifications pertaining to such proposed Subcontractor's respective trades.

Prior to the award of the Contract, the County will notify the Bidder in writing if either the County, after due investigation, has reasonable and substantial objection to any person or organization proposed as a Subcontractor. The Bidder then may, at his option, withdraw his Bid without forfeiture of Bid Security or submit an acceptable substitute at no increase in Bid price. If the Bidder fails to submit an acceptable substitute within seven (7) days of the original notification, the County then may, at his option, disqualify the Bidder, at no cost to the County.

The County reserves the right to disqualify any Contractor, Subcontractor, Vendor, or material supplier due to previously documented project problems, either with performance or quality.

Sub-contractors and other persons and organizations proposed by the Bidder and accepted by the County, must be used on the work for which they were proposed and accepted and shall not be changed except with the written approval of the County.

EMPLOYMENT ELIGIBILITY and MANDATORY USE of E-VERIFY

As a condition precedent to entering into this Agreement, and in accordance with section 448.095, F.S., Contractor and its subcontractors shall register with and use the E-Verify system to verify the work authorization status of all employees hired on or after January 1, 2021 (see **Attachment "K"**).

- a. Contractor shall require each of its subcontractors to provide Contractor with an affidavit stating that the subcontractor does not employ, contract with, or subcontract with an unauthorized alien. Contractor shall maintain a copy of such affidavit for the duration of this Agreement.
- b. The County, Contractor, or any subcontractor who has a good faith belief that a person or entity with which it is contracting has knowingly violated section 448.09(1), F.S. or these provisions regarding employment eligibility shall terminate the contract with the person or entity.

- c. The County, upon good faith belief that a subcontractor knowingly violated these provisions regarding employment eligibility, but Contractor otherwise complied, shall promptly notify Contractor and Contractor shall immediately terminate the contract with the subcontractor.
- d. The County and Contractor hereby acknowledge and mutually agree that, a contract terminated pursuant to these provisions regarding employment eligibility is not a breach of contract and may not be considered as such. Any contract terminated pursuant to these provisions regarding employment eligibility may be challenged in accordance with section 448.095(2)(d), F.S.
- e. Contractor acknowledges that, in the event that the County terminates this Contract for Contractor's breach of these provisions regarding employment eligibility, then Contractor may not be awarded a public contract for at least one (1) year after such termination. Contractor further acknowledges that Contractor is liable for any additional costs incurred by the County as a result of the County's termination of this Agreement for breach of these provisions regarding employment eligibility.
- f. Contractor shall incorporate in all subcontracts made pursuant to this Agreement the provisions contained herein regarding employment eligibility.

PUBLIC CONSTRUCTION BOND

The Contractor shall be required to obtain and submit a recorded Public Construction Bond covering the faithful performance of the Contract and the payment of all obligations arising thereunder in full amount of the Contract, with such acceptable sureties, secured through the Bidder's usual sources as may be agreeable to the parties. The Contractor shall furnish the required bond, after full execution of the awarded Contract. The Bond shall be released upon satisfactory completion of the project.

SURETY BOND

Acceptable Surety Companies: To be responsible to the Owner as Surety on Bonds, Surety shall comply with the following provisions:

1. Surety must be licensed to do business in the State of Florida;
2. Surety must have been in business and have a record of successful continuous operations for at least three (3) years;
3. Surety shall not have exposed itself to any loss on any one risk in an amount exceeding twenty percent (20%) of its surplus to policyholders;
4. Surety must have fulfilled all of its obligations on all other bonds given to the Owner;
5. Surety must have good underwriting, economic management, adequate reserves for undisclosed liabilities, and net resources for unusual stock and sound investment.

Time of Delivery and Form of Bonds

The Public Construction Bond form will be forwarded to the successful Bidder with his copy of the fully executed contract. **The Public Construction Bond must be recorded after the contract is signed by all parties.** The bidder will have three (3) days from receipt of fully executed contract to have the Public Construction Bond recorded. The bidder shall have the Public Construction Bond recorded at the St. Johns County Clerk of Courts office, in St. Augustine, Florida. After the book and page number have been assigned to the bond by the recording person, the Bidder is to obtain from the recording person a certified copy of the recorded bond, and deliver the certified copy to the Owner's Contract Administrator. No work can commence until the required bond and Insurance Certificates have been delivered to the Owner. Upon receipt of the certified copy of the recorded bond, the Owner may issue a Notice to Proceed.

Unless otherwise specified in the Bid Documents, the bonds shall be written on the form provided herein. The Bidder shall require the Attorney-in-Fact who executes the required bonds on behalf of the Surety to affix thereto a certified and current copy of his Power of Attorney authorizing his firm to act as agent for the Surety in issuing the bonds.

INDEMNIFICATION

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, its officials, and employees, from and against liability, claims, damages, losses and expenses including attorney's fees arising out of or resulting from performance of the work, provided that such liability, claims, damages, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part, by negligent acts or omissions

of the Contractor, a Subcontractor, or anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such liability, claim, damage, loss or expense is caused in part by a party indemnified hereunder.

In claims against any person or entity indemnified under this paragraph by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefits acts or other employee benefits acts.

FORCE MAJEURE; DELAYS

Force Majeure: Contractor shall not be liable for failure to carry out the terms of this Agreement to the extent such failure is due to a Force Majeure event, except for failures that could have been reasonably foreseen and guarded against so as to avoid or reduce the adverse impact thereof. A Force Majeure event is hereby defined as the failure to carry out any of the terms of this agreement due to any one of the following circumstances beyond the control of the Contractor: (a) the operation and effect of the rules, regulations, or order promulgated by any commission, county, municipality, or governmental agency of the State of Florida or United States, (b) a restraining order, injunction, or similar decree on any court of competent jurisdiction, (c) war, (d) flood, (e) earthquake, (f) fire, (g) severe wind storm, (h) acts of public disturbance, (i) quarantine restrictions, (j) epidemics, (k) strikes, (l) freight embargoes, or (m) sabotage. The times specified herein for performances include delays that can ordinarily be anticipated due to adverse weather conditions. The County is not obligated to grant an extension of time due to the adverse weather condition unless such conditions rise to the level of Force Majeure.

Delay: Contractor shall not be compensated for delays caused by Contractor's inefficiency, rework made necessary by Contractor's work error, failure to perform the Work as scheduled, or any other corrective or productivity measures made necessary by errors, omissions, or failures to properly perform the Work. Neither shall the Contractor be compensated for delays caused by events by force majeure as described in sub-para (a) above. Within ten (10) days after the onset of a delay, Contractor shall notify the County in writing of the delay which shall provide: (1) a detailed description the delay and its probable duration, (2) the specified portion of the Work affected, and (3) an opinion as to the cause of the delay and liability (if any) for the delay. Notice provided more than ten (10) days after the inception of the delay shall only be effective as to additional time incurred during the ten (10) day period preceding receipt of such notice. In the case of continuing cause delay for the same cause, only one notice of delay is necessary. **Failure to provide this notice waives any claim for extension of time resulting from such delay.** If the delay is due to the failure of another County contractor to complete its work in a timely manner, changes ordered in the Work, a Force Majeure event, or any other cause which the County, in its sole judgment and discretion, determines to justify the delay, then the Completion Date may be extended as necessary to compensate for the delay. All time extensions shall be in the form of a written amendment signed by both parties.

TERMINATION

Failure on the part of the Contractor to comply with any portion of the duties and obligations under the Contract Agreement shall be cause for termination. If the Contractor fails to perform any aspect of the responsibilities described herein St. Johns County shall provide written notification of any and all items of non-compliance. The Contractor shall then have five (5) consecutive calendar days to correct any and all items of non-compliance. If the items of non-compliance are not corrected, or acceptable corrective action has not been taken within the five (5) consecutive calendar days, the Contract Agreement may be terminated by St. Johns County for cause, upon giving fourteen (14) consecutive calendar days written notice to the Contractor.

The County may terminate the Contract Agreement at any time, without cause, upon thirty (30) days written notice to the Contractor of intention to do so.

If, at any time, the Contract Agreement with the awarded vendor is terminated by the County, whether for cause or for convenience, the County may, at its sole discretion, negotiate with the second lowest, responsible, responsive bidder for the required services in order to enter into a contract with that vendor to prevent a gap in services for the County, if it serves the best interest of the County to do so.

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

The Contract that is used for this project shall be on a form provided by the County.

CONTRACT TIME – LIQUIDATED DAMAGES

The Contractor shall have ten (10) days to return Contract originals from the time the Contractor receives a “Notice of Award”. St. Johns County will return a “fully executed” Contract to the Contractor no later than seven (7) days after the return of the executed Contract originals (but no later than seventeen (17) days from the Notice of Award).

The Contractor will furnish a recorded original of the Public Construction Bond three (3) business days after receipt of the fully executed Contract (the Public Construction Bond must be recorded after the Contract is fully executed by all parties including the County Clerk). Upon receipt of the recorded Public Construction Bond, the County will issue a Notice to Proceed. If the Contractor fails to meet any of the dates and timeframes set forth in this section, or fails to execute the Contract, or to provide a Public Construction Bond, the County may elect at its option to consider the Contractor non-responsive and Contract with the next best Bidder.

The work to be performed under this Agreement shall be commenced within **ten (10)** days of the date of the Notice to Proceed, in writing. Construction of the project shall be substantially complete within **three hundred (300)** consecutive calendar days from the date stipulated on the Notice to Proceed. Final completion shall be attained within **thirty (30)** consecutive calendar days from the date of substantial completion.

Conditions under which Liquidated Damages are Imposed:

Should the Contractor or, in case of his default, the Surety fail to complete the work within the time stipulated in the contract, or within such extra time as may have been granted by the Owner, the Contractor or, in case of his default, the Surety shall pay to the Owner, not as a penalty but as liquidated damages, the amount so due as determined by the following schedule:

<u>Original Contract Amount</u>	<u>Daily Charge Per Calendar Day</u>
\$50,000 and under.....	\$956
Over \$50,000 but less than \$250,000.....	\$964
\$250,000 but less than \$500,000.....	\$1,241
\$500,000 but less than \$2,500,000.....	\$1,665
\$2,500,000 but less than \$5,000,000.....	\$2,712
\$5,000,000 but less than \$10,000,000.....	\$3,447
\$10,000,000 but less than \$15,000,000.....	\$4,816
\$15,000,000 but less than \$20,000,000.....	\$5,818
\$20,000,000 and over.....	\$9,198 plus 0.00005 of any amount over \$20 million (Round to nearest whole dollar)

INSURANCE

The Contractor shall not commence work under this Contract until he/she has obtained all insurance required under this section and such insurance has been approved by the County. All insurance policies shall be issued by companies authorized to do business under the laws of the State of Florida. The Contractor shall furnish proof of Insurance to the County prior to the commencement of operations. The Certificate(s) shall clearly indicate the Contractor has obtained insurance of the type, amount, and classification as required by contract and that no material change or cancellation of the insurance shall be effective without thirty (30) days prior written notice to the County. Certificates shall specifically include the County as Additional Insured for all lines of coverage except Workers’ Compensation and Professional Liability. A copy of the endorsement must accompany the certificate. Compliance with the foregoing requirements shall not relieve the Contractor of its liability and obligations under this Contract.

Certificate Holder Address:

St. Johns County, a political subdivision of the State of Florida
500 San Sebastian View
St. Augustine, FL 32084

The Contractor shall maintain during the life of the awarded Agreement, Comprehensive General Liability Insurance with minimum limits of \$1,000,000 per occurrence, \$2,000,000 aggregate, to protect the Contractor from claims for damages for bodily injury, including wrongful death, as well as from claims of property damages which may arise from any operations under this contract, whether such operations be by the Contractor or by anyone directly employed by or contracting with the Contractor.

The Contractor shall maintain during the life of the awarded Agreement, Umbrella or Excess Liability Insurance covering workers compensation, commercial general liability and business auto liability with minimum limits of liability of \$1,000,000.

The Contractor shall maintain during the life of the awarded Agreement, adequate Workers' Compensation Insurance in at least such amounts as is required by the law for all of its employees per Florida Statute 440.02.

The Contractor shall maintain during the life of the awarded Agreement, Comprehensive Automobile Liability Insurance with minimum limits of \$1,000,000 combined single limit for bodily injury and property damage liability to protect the Contractor from claims for damages for bodily injury, including the ownership, use, or maintenance of owned and non-owned automobiles, including rented/hired automobiles whether such operations be by the Contractor or by anyone directly or indirectly employed by a Contractor.

In the event of unusual circumstances, the County Administrator, or his designee, may adjust these insurance requirements.

GOVERNING LAWS & REGULATIONS

The Contractor shall be responsible for being familiar and complying with any and all federal, state, and local laws, ordinances, rules and regulations that, in any manner, affect the work required under this contract. The agreement shall be governed by the laws of the State of Florida and St. Johns County both as to interpretation and performance.

TAXES

Project is subject to Federal Excise and Florida Sales Taxes, which must be included in Bidder's proposal.

FLORIDA TRENCH SAFETY ACT

Bidders shall complete Certificate of Compliance with Florida Trench Safety Act, in accordance with the requirements of Chapter 553, Florida Statutes. If trenching is not required for this project, state so thereon. Contractor shall be responsible for compliance with all trenching shoring safety requirements (**Attachment F**).

OSHA REQUIREMENTS

The Contractor warrants that the product, products, or services supplied to St. Johns County shall conform in all respects to the standards set forth in the Occupational Safety and Health Act (OSHA) of 1970 as amended and the failure to comply will be considered a breach of contract. St. Johns County shall be held harmless against any unsafe conditions and contractor employee incidents.

COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT

Contractor certifies that all material, equipment, services, etc., furnished in this bid meets all OSHA requirements for the applicable Sectors. Bidder further certifies that, if he is the successful bidder, and the material, equipment, service, etc., delivered or provided is subsequently found to be deficient in any OSHA requirement in effect on date of delivery or service fulfillment date, all costs necessary to bring the material, equipment, service, etc., into compliance with the aforementioned requirements shall be borne by the bidder. All Personal Protective Equipment used by the contractor and their employees shall be ANSI certified and meet OSHA standards.

TRAINING AND EDUCATION (APPLICABLE ONLY WITH CONSTRUCTION SERVICES)

Contractors will ensure that Contractor employees are trained appropriately for their work tasking. The minimum requirements are found in Federal and State Regulations. Examples of this training are (but not limited to):

- Lockout Tagout
- Fall Protection
- Electrical Safety and the National Electrical Code (NEC)
- Confined Space Entry
- Hot Work
- Specific Chemical Hazards
- Excavations and Trenching
- Heavy Equipment Operation

Special emphasis should be given towards training and compliance with the Construction industry's "Focus Four" established by OSHA as an outreach program to the construction industry and its workers. Training, education, and awareness should be provided in the areas of: 1) Fall Hazards 2) Caught-In and Between Hazards 3) Struck-By Hazards and 4) Electrocutation Hazards.

TOXIC SUBSTANCES / FEDERAL HAZARD COMMUNICATION "RIGHT TO KNOW AND UNDERSTAND" REGULATIONS

The Federal "Right to Know and Understand" Regulation (also known as the Hazard Communication / Globally Harmonized System of Classification and Labeling of Chemicals (GHS) implemented by OSHA requires employers to inform their employees of any toxic substances to which they may be exposed in the workplace, and to provide training in safe chemical storage, labeling, handling practices and emergency procedures.

Accordingly, the Contractor(s) performing under this contract shall be required to provide two (2) complete sets of Safety Data Sheets (SDS) to each of the departments utilizing the awarded products. This information should be provided at the time when the initial delivery is made, on a department-by-department basis. If performing work on site, it is preferred that each contractor bring their hazardous communication program and SDS in a binder labeled with the contractor's name and identified as a Hazardous Communication/GHS Program. Upon leaving the jobsite and the removal of all hazardous materials, contractors shall take their information with them.

The transport, use, and disposal of toxic substances must be conducted in accordance with DEP/EPA regulations. Upon request, contractors working at St. Johns County facilities or jobsites will be given access to the written Hazardous Communication Program and informed where to locate SDS.

TEMPORARY TRAFFIC CONTROL (TTC)/MAINTENANCE OF TRAFFIC (MOT) (APPLICABLE ONLY WITH CONSTRUCTION SERVICES)

The Contractor must comply with the Florida Department of Transportation's (DOT) Temporary Traffic Control (TTC) and the Manual on Uniform Traffic Control Devices (MUTCD) in the planning, development, design, implementation, operation, enforcement and inspection of work zone related transportation management and temporary traffic control on streets and highways within the State Highway System right-of-way. Training in the Advanced, Intermediate, and Flagger categories must be completed by the Contractor for their employee when performing right-of-way work while under contract with St. Johns County. Contractor employees must wear a Class II (daytime), Class III (night/limited visibility) high-visibility safety vest or equivalent high-visibility apparel while performing any work that places them in the right-of-way.

OWNER DIRECT PURCHASE

St. Johns County reserves the right to Owner Direct Purchase materials or equipment in accordance with County Purchasing Policy 302.21 or implement other means in order to achieve related sales tax or other cost savings.

PUBLIC RECORDS

- A. The cost of reproduction, access to, disclosure, non-disclosure, or exemption of records, data, documents, and/or materials, associated with this Agreement shall be subject to the applicable provisions of the Florida Public Records Law (Chapter 119, Florida Statutes), and other applicable State and Federal provisions. Access to such public records, may not be blocked, thwarted, and/or hindered by placing the public records in the possession of a third party, or an unaffiliated party.
- B. In accordance with Florida law, to the extent that Contractor's performance under this Contract constitutes an act on behalf of the County, Contractor shall comply with all requirements of Florida's public records law. Specifically, if Contractor is expressly authorized, and acts on behalf of the County under this Agreement, Contractor shall:
 - (1) Keep and maintain public records that ordinarily and necessarily would be required by the County in order to perform the Services;
 - (2) Upon request from the County's custodian of public records, provide the County with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost as provided in Chapter 119, Florida Statutes, or as otherwise provided by law;
 - (3) Ensure that public records related to this Agreement that are exempt or confidential and exempt from public records

disclosure requirements are not disclosed except as authorized by applicable law for the duration of this Agreement and following completion of this Agreement if the Contractor does not transfer the records to the County; and

- (4) Upon completion of this Agreement, transfer, at no cost, to the County all public records in possession of the Contractor or keep and maintain public records required by the County to perform the Services.

If the Contractor transfers all public records to the County upon completion of this Agreement, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Agreement, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the County, upon request from the County's custodian of public records, in a format that is compatible with the County's information technology systems.

Failure by the Contractor to comply with the requirements of this section shall be grounds for immediate, unilateral termination of this Agreement by the County.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO ITS DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

**500 San Sebastian View
St. Augustine, FL 32084
(904) 209-0805
publicrecords@sjcfl.us**

END OF SECTION

**OFFICIAL COUNTY BID FORM
WITH ATTACHMENTS**

BID NO: 22-34

**OFFICIAL COUNTY BID FORM
ST. JOHNS COUNTY, FLORIDA**

TO: THE BOARD OF COUNTY COMMISSIONERS OF ST. JOHNS COUNTY, FLORIDA

DATE SUBMITTED: _____

BID PROPOSAL OF

Full Legal Company Name

Mailing Address Telephone Number Fax Number

Bidders: Having become familiar with requirements of the project, and having carefully examined the Bid Documents and Specifications entitled for **Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements** in St. Johns County, Florida, the undersigned proposes to furnish all materials, labor and equipment, supervision and all other requirements necessary to comply with the Contract Documents to submit the following Bid Proposal summarized as follows:

LUMP SUM BASE BID PRICE:

\$ _____
Lump Sum Base Bid Price (Numerical)

_____/100 Dollars
Lump Sum Base Bid Price (Amount written or typed in words)

***LABORATORY TEST ALLOWANCE (for soil density and concrete):** \$ 10,000.00

***RESTRAINT ALLOWANCE (at the tie-in point):** \$ 10,000.00

**These allowances are estimated unit price allowances that will be adjusted (+/-) based upon actual costs for applicable testing, and must be verified by an invoice from the testing facility.*

TOTAL BID PRICE (Lump Sum Base Bid + Total Test Allowance + Restraint Allowance):

\$ _____
Total Bid Price (Numerical)

_____/100 Dollars
Total Bid Price (Amount written or typed in words)

Bidder shall insert the Total Bid Price amount in numerals and in words. In the event of a discrepancy between the two amounts, the amount written in words will prevail. The Total Bid Price shall be the amount derived from adding the Lump Sum Base Bid amount and the provided allowances. If a math error occurs, the County shall re-calculate based upon the Lump Sum Base Bid and allowance amounts to determine the correct Total Bid Price.

BID NO: 22-34

During the preparation of the Bid, the following addenda, if any, were received:

No.:	_____	Date Received:	_____
No.:	_____	Date Received:	_____
No.:	_____	Date Received:	_____

The Undersigned hereby declares that no person or persons, firm, or corporation, other than the undersigned are interested in this bid proposal, as principals, and that this bid proposal is made without collusion with any person, firm, or corporation, and the undersigned has carefully examined, and is thoroughly familiar with the requirements and specifications of this Bid.

The Undersigned certifies that a full examination of the locations of the proposed work and the sources of supply of materials has been completed, and agrees to furnish all necessary labor, equipment and materials, fully understanding that any quantities shown herein are approximate only, and will fully complete all requirements provided herein within the same time limit specified in the Bid Documents as indicated above.

If the Undersigned is notified of the acceptance of this Bid by the County within ninety (90) consecutive calendar days for the time set from the time set for opening of Bids, the Undersigned further agrees, to execute a contract for the above work within ten (10) days after notice that his Bid has been accepted for the above stated compensation in the form of a Contract presented by the Owner.

The Undersigned further agrees that security in the form of a Bid Bond, certified or cashier's check in the amount of not less than five percent (5%) of Total Bid Price, payable to the Owner, accompanies this Bid; that the amount is not to be construed as a penalty, but as liquidated damages which said Owner will sustain by failure of the Undersigned to execute and deliver the Contract and Bond within ten (10) days of the written notification of the Award of the Contract to him; thereupon, the security shall become the property of the Owner, but if this Bid is not accepted within ninety (90) days of the time set for the submission of Bids, or if the Undersigned delivers the executed Contract upon receipt, the Security shall be returned to the Bidder within seven (7) working days.

The undersigned pledges to provide the materials and services as specified in the Bid Documents barring delays due to strikes, fires, transportation difficulties or other causes beyond the control of the undersigned.

The undersigned declares that the statements and representations made in this bid proposal are true in every respect and that the said proposal is, in all respects, fair and made without collusion or fraud, and that no member of the St. Johns County Board, or any other agent or employee of the County, directly or indirectly, is interested in this proposal or in any profits expected to accrue therefrom

BID NO: 22-34

CORPORATE/COMPANY

Full Legal Company Name: _____(Seal)

By: _____
Signature of Authorized Representative (Name & Title typed or printed)

By: _____
Signature of Authorized Representative (Name & Title typed or printed)

Address: _____

Telephone No.: (____) _____ Fax No.: (____) _____

Email Address for Authorized Company Representative: _____

Federal I.D. Tax Number: _____ DUNS #: _____
(If applicable)

INDIVIDUAL

Name: _____
(Signature) (Name typed or printed) (Title)

Address: _____

Telephone No.: (____) _____ Fax No.: _____

Email Address: _____

Federal I.D. Tax Number: _____

Submittal Requirements:

- Official County Bid Form
- Attachment "A" – St Johns County Board of County Commissioners Affidavit
- Attachment "B" – Certificate as to Corporate Principal
- Attachment "C" – License/Certification List
- Attachment "D" – List of Proposed Sub-Contractors/Suppliers
- Attachment "E" – Conflict of Interest Disclosure Form
- Attachment "F" – Certificate of Compliance with Florida Trench Safety Act
- Attachment "G" – Proof of Insurance
- Attachment "H" – Contractor's Qualifications Form
- Attachment "I" – Drug Free Workplace Form
- Attachment "J" – Claims, Liens, Litigation History
- Attachment "K" – E-Verify Affidavit
- Attachment "L" – Local Preference
- Bid Bond
- Sealed Bid Mailing Label

Official County Bid Form, Attachments, and Bid Bond must be completed, along with a fully acknowledged copy of each Addendum applicable to this Bid and submitted with each copy of the Bid Proposal. One (1) original and two (2) copies of all required forms must be submitted.

ATTACHMENT "A"

BID PROPOSAL AFFIDAVIT

TO: ST. JOHNS COUNTY, BOARD OF COUNTY COMMISSIONERS,
ST. AUGUSTINE, FLORIDA.

At the time the proposal is submitted, the Bidder shall attach to his Bid a sworn statement.

This sworn statement shall be an affidavit in the following form, executed by an officer of the firm, association, or corporation submitting the proposal, and shall be sworn to before a person who is authorized by law to administer oaths.

STATE OF _____
COUNTY OF _____

The Undersigned authority, _____ (Affiant), who being duly sworn, deposes and says he/she is _____ (Title) of the firm of _____ (Bidder), submitting the attached bid proposal for the services covered by the bid documents for Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements, in St. Johns County, Florida.

The affiant further states that no more than one bid proposal for the above-referenced project will be submitted from the individual, his/her firm or corporation under the same or different name, and that such Bidder has no financial interest in the firm of another bidder for the same work. That neither the individual, his/her firm, association nor corporation has either directly or indirectly entered into any agreement, participated in any collusion, nor otherwise taken any action in restraint of free competitive bidding in connection with this firm’s Bid on the above-described project. Furthermore, neither the firm nor any of its officers are barred from participating in public contract lettings in the State of Florida or any other state.

DATED this _____ day of _____, 20____.

Signature of Affiant

Printed Name of Affiant

Printed Title of Affiant

Full Legal Name of Consultant/Contractor

Sworn to (or affirmed) and subscribed before me by means of physical presence or online notarization, this _____ day of _____, 20____, by _____ (Name & Title of Affiant), who is personally known to me or has produced _____ as identification.

Notary Public
My Commission Expires: _____

BIDDER MUST EXECUTE AND ATTACH THIS AFFADAVIT TO BID.

ATTACHMENT "B"

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the Corporation named as Principal in the attached bond; that _____ who signed the said bond on behalf of the Principal, was then _____ of said Corporation; that I know his signature, and his signature hereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said Corporation by authority of its governing body.

Secretary

Corporate Seal

STATE OF _____
COUNTY OF _____

Sworn to (or affirmed) and subscribed before me by means of physical presence or online notarization, this _____ day of _____, 20____, by _____ (Name & Title of Affiant), who is personally known to me or has provided _____ as identification, who sworn upon oath, says he/she is the Attorney-in-Fact for _____ and that he/she has been authorized to execute the foregoing bond on behalf of the surety named therein in favor of St. Johns County.

Notary Public
My Commission Expires: _____

(Attach Power of Attorney to original Bid Bond and Financial Statement of Surety Company)

ATTACHMENT "E"

**ST. JOHNS COUNTY BOARD OF COUNTY COMMISSIONERS
CONFLICT OF INTEREST DISCLOSURE FORM**

Project (BID) Number/Description: Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements

The term "conflict of interest" refers to situations in which financial or other considerations may adversely affect, or have the appearance of adversely affecting a consultant's/contractor's professional judgment in completing work for the benefit of St. Johns County ("County"). The bias such conflicts could conceivably impart may inappropriately affect the goals, processes, methods of analysis or outcomes desired by the County.

Consultants/Contractors are expected to safeguard their ability to make objective, fair, and impartial decisions when performing work for the benefit of the County. Consultants/Contractors, therefore must there avoid situations in which financial or other considerations may adversely affect, or have the appearance of adversely affecting the consultant's/contractor's professional judgement when completing work for the benefit of the County.

The mere appearance of a conflict may be as serious and potentially damaging as an actual distortion of goals, processes, methods of analysis or outcomes. Reports of conflicts based upon appearances can undermine public trust in ways that may not be adequately restored even when the mitigating facts of a situation are brought to light. Apparent conflicts, therefore, should be disclosed and evaluated with the same vigor as actual conflicts.

It is expressly understood that failure to disclose conflicts of interest as described herein may result in immediate disqualification from evaluation or immediate termination from work for the County.

Please check the appropriate statement:

- I hereby attest that the undersigned Respondent has no actual or potential conflict of interest due to any other clients, contracts, or property interests for completing work on the above referenced project.
- The undersigned Respondent, by attachment to this form, submits information which may be a potential conflict of interest due to other clients, contracts or property interests for completing work on the above referenced project.

Legal Name of Respondent: _____

Authorized Representative(s): _____

Signature

Print Name/Title

Signature

Print Name/Title

BID NO: 22-34

ATTACHMENT "F"

CERTIFICATE OF COMPLIANCE WITH FLORIDA TRENCH SAFETY ACT

Bidder acknowledges that he is solely responsible for complying with the Florida Trench Safety Act (ACT) and Occupational Safety and Health Administrations excavation safety standard 29 CFR 1926.650 (Subpart P as amended) and the St. Johns County Trenching and Excavation Safety Program. If there is a conflict between the ACT and the St. Johns County Trenching and Excavation Safety Program, the more stringent requirement would apply. Bidder further acknowledges that included in the various items of the proposal and in the Total Bid Price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) effective October 1, 1990 and the Occupational Safety and Health Administrations excavation safety standard.

By:
Authorized Representative Signature

Printed Name & Title

Date

BID NO: 22-34

ATTACHMENT "G"

CERTIFICATE OF INSURANCE

INSERT CERTIFICATE OF INSURANCE HERE

Bidders shall provide certificates of insurance reflecting the required coverages, or certification from a qualified insurance provider as to the Bidder's ability to obtain the required coverages upon award, as part of their bid proposal. Certificates of Insurance shall meet or exceed the requirements as described under Insurance.

Failure to provide proof of current insurance coverage or ability to obtain the required coverages may result in being deemed non-responsive and remove from further consideration.

(Attach or insert a copy of "Certificate of Insurance" here)

ATTACHMENT "H"

CONTRACTOR'S QUALIFICATIONS FORM

Bidder acknowledges that he is fully licensed to perform work in the State of Florida. Any material misrepresentation, as determined by the County, shall result in disqualification.

By: _____ Date _____
 Bidder

 Authorized Signature

Contractor's Project Experience

Prime bidder must be fully licensed to do business in the State of Florida and hold a current Certified General Contractor's license Bidders must have successfully completed, as a Prime or Sub-contractor, at least three (3) projects, in the past five (5) years, of similar type, size and dollar value of the project described herein. One or more of these three (3) projects must include the installation of wellhead, vertical turbine pump, 12" and larger flanged and mechanical joint pipe, fittings, and valves, and a generator in a remote setting. The dollar value of similar projects must be at least 75% of the submitted bid.

Contractor's Project Experience Details Project No. 1	
Name of Project:	
Project Manager Name:	
Superintendent Name:	
Project Description:	
Owner Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Engineer/Architect Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Contract Dates	
Started:	
Original Contractual Completion:	

BID NO: 22-34

Contractor's Project Experience Details Project No. 1	
Final Contractual Completion:	
Actual Completion:	
Contract Value	
Original Contract Value:	
Final Contract Value:	
Value of Change Orders to Date:	
Value of Outstanding Claims to Date:	
Bonding Company Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Major Subcontractor Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	

Contractor's Project Experience Details Project No. 2	
Name of Project:	
Project Manager Name:	
Superintendent Name:	
Project Description:	
Owner Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Engineer/Architect Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Contract Dates	
Started:	
Original Contractual Completion:	
Final Contractual Completion:	
Actual Completion:	
Contract Value	
Original Contract Value:	
Final Contract Value:	
Value of Change Orders to Date:	
Value of Outstanding Claims to Date:	
Bonding Company Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	

BID NO: 22-34

Contractor's Project Experience Details Project No. 2	
Major Subcontractor Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	

Contractor's Project Experience Details Project No. 3	
Name of Project:	
Project Manager Name:	
Superintendent Name:	
Project Description:	
Owner Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Engineer/Architect Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	

BID NO: 22-34

Contractor's Project Experience Details Project No. 3	
Contract Dates	
Started:	
Original Contractual Completion:	
Final Contractual Completion:	
Actual Completion:	
Contract Value	
Original Contract Value:	
Final Contract Value:	
Value of Change Orders to Date:	
Value of Outstanding Claims to Date:	
Bonding Company Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Major Subcontractor Information	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	
Name:	
Address:	
Contact Person:	
Telephone Number:	

Additional Questions

Do you have any similar work in progress at this time? _____ Yes _____ No

Length of time in business: _____ years

ATTACHMENT "I"

DRUG-FREE WORKPLACE FORM

The undersigned firm, in accordance with Florida Statute 287.087 hereby certifies that
_____ does:

Name of Firm

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the danger of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, employee assistance programs and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the contractual services that are described in St. Johns County's request for proposals to provide bond underwriter services a copy of the statement specified in paragraph 1.
4. In the statement specified in paragraph 1, notify the employees that, as a condition of working on the contractual services described in paragraph 3, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Florida Statute 893, as amended, or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction or plea.
5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community by, any employee who is so convicted.
6. Consistent with applicable provisions with State or Federal law, rule, or regulation, make a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs 1 through 5.

As the person authorized to sign this statement, I certify that this firm complies fully with the above requirements.

Signature

Date

ATTACHMENT "J"

CLAIMS, LIENS, LITIGATION HISTORY

(Complete and Submit)

1. Within the past 7 years, has your organization filed suit or a formal claim against a project owner (as a prime or subcontractor) or been sued by or had a formal claim filed by an owner, subcontractor or supplier resulting from a construction dispute? Yes _____ No _____ If yes, please attach additional sheet(s) to include:

Description of every action Captions of the Litigation or Arbitration

Amount at issue: _____ Name (s) of the attorneys representing all parties:

Amount actually recovered, if any: _____

Name(s) of the project owner(s)/manager(s) to include address and phone number:

2. List all pending litigation and or arbitration.
3. List and explain all litigation and arbitration within the past seven (7) years - pending, resolved, dismissed, etc.
4. Within the past 7 years, please list all Liens, including Federal, State and Local, which have been filed against your Company. List in detail the type of Lien, date, amount and current status of each Lien. _____

5. Have you ever abandoned a job, been terminated or had a performance/surety bond called to complete a job? Yes _____ No _____ If yes, please explain in detail: _____

6. For all claims filed against your company within the past five-(5) years, have all been resolved satisfactorily with final judgment in favor of your company within 90 days of the date the judgment became final? Yes _____ No _____ If no, please explain why? _____

7. List the status of all pending claims currently filed against your company: _____

Liquidated Damages

1. Has a project owner ever withheld retainage, issued liquidated damages or made a claim against any Performance and Payment Bonds? Yes _____ No _____ If yes, please explain in detail: _____

(Use additional or supplemental pages as needed)

ATTACHMENT "K"

E-VERIFY AFFIDAVIT

Contract No.: Bid No: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements

STATE OF _____
COUNTY OF _____

I, _____ (hereinafter "Affiant"), being duly authorized by and on behalf of _____ (hereinafter "Contractor") hereby swears or affirms as follows:

1. Contractor understands that E-Verify, authorized by Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRIRA), is a web-based system provided by the United States Department of Homeland Security, through which employers electronically confirm the employment eligibility of their employees.
2. For the duration of Contract No. _____ (hereinafter "Agreement"), in accordance with section 448.095, F.S., Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the Contractor and shall expressly require any subcontractors performing work or providing services pursuant to the Agreement to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor.
3. Contractor shall comply with all applicable provisions of section 448.095, F.S., and will incorporate in all subcontracts the obligation to comply with section 448.095, F.S.
4. Contractor understands and agrees that its failure to comply with all applicable provisions of section 448.095, F.S. or its failure to ensure that all employees and subcontractors performing work under the Agreement are legally authorized to work in the United States and the State of Florida constitute a breach of the Agreement for which St. Johns County may immediately terminate the Agreement without notice and without penalty. The Contractor further understands and agrees that in the event of such termination, Contractor shall be liable to the St. Johns County for any costs incurred by the St. Johns County resulting from Contractor's breach.

DATED this _____ day of _____, 20____.

Signature of Affiant

Printed Name of Affiant

Printed Title of Affiant

Full Legal Name of Consultant/Contractor

Sworn to (or affirmed) and subscribed before me by means of physical presence or online notarization, this day of _____, 20____, by _____ {insert name and title of Affiant}, who is personally known to me or has produced _____ as identification.

Notary Public
My Commission Expires: _____

ATTACHMENT “L”

LOCAL PREFERENCE

Any Respondent that meets the criteria of a Local Business, in accordance with Section 302.25 of the SJC Purchasing Procedure Manual, must complete and sign this Attachment “I” to indicate their qualification to receive local preference. All required documentation to demonstrate that the Respondent meets all qualification criteria as a local business must be included in the submitted proposal/submittal with this Attachment “L”.

In order to qualify for local preference Respondent must provide sufficient documentation to demonstrate:

- A physical, brick and mortar place of business located within the geographic boundaries of St. Johns County, with a valid mailing address, in an area zoned for the conduct of such business, from which the Vendor has operated or performed business on a day-to-day basis that is substantially similar to those specified in the solicitation for a period of at least one (1) calendar year prior to the issuance of the solicitation. No PO Boxes shall be accepted.
- Local address above must be registered as the Vendor’s principal place of business with the Divisions of Corporations Florida Department of State for at least one (1) calendar year prior to the issuance of this BID.
- Submit current and valid Local Business Tax Receipt, and must have Local Business Tax Receipts issued by the St. Johns County Tax Collector from at least one (1) calendar year prior to issuance of this BID.
- Must qualify as a local business as shown above **AND** self-perform a minimum of fifty percent (50%) of all services under the awarded Contract, or must have a minimum of fifty percent (50%) of all services performed by qualified local businesses as sub-contractors or sub-consultants.

If qualifying for local preference through the use of qualified local sub-contractors or sub-consultants, Respondent must submit all required documentation to demonstrate the above requirements of all proposed sub-contractors and sub-consultants for local preference consideration with the submitted proposal.

Respondent is a Local Business as defined in Section 302.25, SJC Purchasing Procedure Manual _____

Respondent is **not** a Local Business as defined in Section 302.25, SJC Purchasing Procedure Manual _____

Signature – Authorized Respondent Representative

Printed Name & Title

Date of Signature

BID BOND

STATE OF FLORIDA
COUNTY OF ST. JOHNS

KNOW ALL MEN BY THESE PRESENTS, that _____ as Principal, and as Surety, are held and firmly bound unto St. Johns County, Florida, in the penal sum of Dollars (\$ _____) lawful money of the United States, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATIONS IS SUCH that whereas the Principal has submitted the accompanying Bid, dated _____, 20__.

For
Northwest Well No. 7 Wellhead and Site Improvements, St. Johns County, Florida

NOW THEREFORE,

- (a) If the Principal shall not withdraw said Bid within ninety (90) days after Bid Award date, and shall within ten (10) days after prescribed forms are presented to him for signature, enter into a written Contract with the County in accordance with the Bid as accepted, and give Bond with good and sufficient Surety or Sureties, as may be required, for the faithful performance and proper fulfillment of such Contract, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.
- (b) In the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such Bond within the time specified, if the Principal shall pay the County the difference between the amount specified, in said Bid and the amount for which the County may procure the required Work and supplies, if the latter amount be in excess of the former, then the above obligations shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals, this day of A.D., 20__, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

BID NO: 22-34

WITNESSES:

(If Sole Ownership or Partnership two (2) Witnesses required).
(If Corporation, Secretary only will attest and affix seal).

WITNESSES:

PRINCIPAL:

NAME OF FIRM:

SIGNATURE OF AUTHORIZED
OFFICER (AFFIX SEAL)

TITLE

BUSINESS ADDRESS

CITY STATE

WITNESS:

SURETY:

CORPORATE SURETY

ATTORNEY-IN-FACT (AFFIX SEAL)

BUSINESS ADDRESS

CITY STATE

NAME OF LOCAL INSURANCE AGENCY

BID NO: 22-34

SEALED BID MAILING LABEL

BID NO: 22-34 – Northwest Well No. 7 Wellhead and Site Improvements

**Cut along the outer border and affix this label
to your sealed bid envelope to identify it as a
"Sealed BID"**

SEALED BID • DO NOT OPEN	
SEALED BID NO.:	BID NO: 22-34
BID TITLE:	Northwest Well No. 7 Wellhead and Site Improvements
DUE DATE/TIME:	By 2:00PM, December 15, 2021
SUBMITTED BY:	_____ Company Name
	_____ Company Address
	_____ Company Address
DELIVER TO:	St. Johns County Purchasing Division 500 San Sebastian View St. Augustine FL 32084



END OF DOCUMENT

**ST. JOHNS COUNTY UTILITY DEPARTMENT
NORTHWEST WELL NO. 7
WELLHEAD AND SITE CONSTRUCTION PROJECT**

BID DOCUMENTS

BID NUMBER: XX-XX

May 2021



Board of County Commissioners
St. Johns County, Florida

Jacobs

LARRY GUNN, P.E.
200 W FORSYTH STREET, SUITE 1520
JACKSONVILLE, FL 32202
ARCHITECTURAL BUSINESS NO. AAC001992 ENGINEERING BUSINESS NO. EB0000072

JACOBS ENGINEERS INC, PROJECT NO. EGXM1300

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WELLHEAD AND SITE DESIGN

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END OF SECTION

**TECHNICAL
SPECIFICATIONS**

**SECTION 01 11 00
SUMMARY OF WORK**

PART 1 GENERAL

1.01 DEFINITIONS

- A. Owner: St. Johns County Utility Department.
- B. Contractor: To be Determined.
- C. Engineer: Jacobs Engineering, Inc., 200 W Forsyth Street, Suite 1520, Jacksonville, FL 32202.
- D. Project Site: Northwest Wellfield Floridan Aquifer Production Well No. 7

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. All Work shall conform to St. Johns County Utility Department Standards and these contract documents. Except as authorized by the Project Director, in case of conflicts between these contract documents and St. Johns County Utility Department's Manual of Water, Wastewater, and Reuse Design Standards and Specifications, the stricter standard or specification shall apply.
- B. The Completed Work includes the following:
 - 1. The Contractor shall furnish and install the wellhead piping and associated appurtenances, raw water main, concrete well pad, instruments, controls, and electrical equipment as shown on Drawings.
 - 2. The Contractor shall furnish and install the final well casing flange.
 - 3. The Contractor shall install an owner furnished vertical turbine well pump and 50-HP motor.
 - 4. The Contractor shall furnish and install a 50 hp Variable Frequency Drive (VFD).
 - 5. The Contractor shall install an owner furnished 50 kW standby diesel generator sets and automatic transfer switch.
 - 6. The Contractor shall install all necessary soil and erosion control devices as shown on Drawings and as required by local authorities.
 - 7. The Contractor shall construct the well site access road shown on the Drawings.
 - 8. The Contractor shall clear and purge the well and raw water main per St. Johns County Utility Department.

SJCUD NORTHWEST WELL NO. 7
WELLHEAD AND SITE DESIGN

9. The Contractor shall flush the pump, associated wellhead piping, and raw water main per Section 40 27 01, Piping-General, and St. Johns County Utility Department Standards, Section 3.9 Pressure and Leakage Testing of Pressurized Piping.
 10. The Contractor shall pressure test and disinfect the wellhead piping and raw water main per Section 40 27 01, Piping-General, and St. Johns County Utility Department Standards, Section 3.9 Pressure and Leakage Testing of Pressurized Piping. The Contractor shall also disinfect the well. Samples shall be collected per the requirements in the FDEP PWS Permit.
- C. Work includes manufacture, delivery, and services for motor control centers, variable frequency drives, SCADA panels, instrument elements, and instrument transmitters for St. Johns County Utility Department water supply wells.
- D. As-built, Record Drawing survey requirements are called out in Section 01 77 00, Closeout Procedures.

1.03 DEFINITIONS

- A. The following definitions shall apply to these Specifications:
1. Standard Supplier: The party under Contract with the Owner for furnishing the products covered by this Contract.
 2. Installing Contractor: The party under Contract with the Owner who installs the products(s) furnished under this Contract.

1.04 TEMPORARY FACILITIES

- A. Temporary water is not available at the Site. The Contractor shall provide all temporary water for flushing, disinfection, and pressure testing.
- B. The Contractor is responsible for providing a plan for flushing and draining pipeline.

1.05 SANITARY FACILITIES

- A. The Contractor shall provide a chemical toilet of suitable type and maintain the unit in a sanitary condition at all times.

1.06 DISPOSAL OF WASTEWATER

- A. The Contractor is responsible for the disposal and waste of all water used to clear, purge, flush, performance test, or pressure test the wells, pumps, and associated piping. The Contractor shall submit to the Owner a detailed disposal plan for approval no later than 14 days prior to commencing any Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 PROPOSAL REQUESTS

- A. Owner may, in anticipation of ordering an addition, deletion, or revision to the Work, request Contractor to prepare a detailed proposal of cost and times to perform contemplated change.
- B. Proposal request will include reference number for tracking purposes and detailed description of and reason for proposed change, and such additional information as appropriate and as may be required for Contractor to accurately estimate cost and time impact on Project.
- C. Proposal request is for information only; Contractor is neither authorized to execute proposed change nor to stop Work in progress as result of such request.
- D. Contract modification procedures, including Contractor claims, field orders and changes in work shall be as specified in Article XI Changes in Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01 29 00
PAYMENT PROCEDURES**

PART 1 GENERAL

1.01 SUBMITTALS

- A. Submittals for payments under this contract shall comply with Article XV, Payments to the Contractor.
- B. Informational Submittals:
 - 1. Schedule of Values: Submit on Contractor's standard form.
 - 2. Schedule of Estimated Progress Payments:
 - a. Submit with initially acceptable Schedule of Values.
 - b. Submit adjustments thereto with Application for Payment.
 - 3. Application for Payment.
 - 4. Final Application for Payment.

1.02 SCHEDULE OF VALUES

- A. Prepare a separate Schedule of Values for each schedule of the Work under the Agreement as outlined in Article V, Paragraph 5.1 Schedule of Values of the Agreement.
- B. Lump Sum Work:
 - 1. Reflect specified cash and contingency allowances and alternates, as applicable.
 - 2. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, equipment testing, facility startup, and contract closeout separately.

1.03 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

- A. Show estimated payment requests throughout Contract Times aggregating initial Contract Price.
- B. Base estimated progress payments on initially acceptable progress schedule. Adjust to reflect subsequent adjustments in progress schedule and Contract Price as reflected by modifications to the Contract Documents.

SJCUD NORTHWEST WELL NO. 7
WELLHEAD AND SITE DESIGN

1.04 APPLICATION FOR PAYMENT

- A. Submit Applications for Payment as described in Article V, Paragraph 5.2 Payment Procedure in the Agreement.
- B. Include separate line item for each Change Order and Work Change Directive executed prior to date of submission. Provide further breakdown of such as requested by the Project Director.
- C. Preparation:
 - 1. Round values to nearest dollar.
 - 2. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form(s) for each schedule as applicable, , and such supporting data as may be requested by the Project Director.

1.05 PAYMENT

- A. Payment for all Lump Sum Work shown or specified in Contract Documents is included in the Contract Price. Payment will be based on a percentage complete basis for each line item of the accepted Schedule of Values.
- B. Owner may decline to or withhold payments as described in Article V, Paragraph 5.3 in the Agreement.
- C. Payments to the Contractor for substantial and final completion shall be as described in Article V, Paragraphs 5.5 and 5.6 of the Agreement.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 13
PROJECT COORDINATION

PART 1 GENERAL

1.01 RELATED WORK AT SITE

A. General:

1. The Contractor that performs the work herein is henceforth referred to be the Wellhead Contractor, Installing Contractor, Contractor, or Standard Supplier.
2. Other work that is either directly or indirectly related to the scheduled performance of Work under these Contract Documents, listed henceforth, is anticipated to be performed at Site by others.
3. Coordinate the Work of these Contract Documents with work of others.
4. Include sequencing constraints specified herein as a part of Progress Schedule.

B. Power:

1. Agency and Contact Person FPL: Jessica Lonas (904) 824-7603.
2. Work to be performed by FPL: Termination of power cables to primary of utility transformers.
3. Work to be performed by Contractor:
 - a. Coordinate Contractor's Work with FPL.
 - b. Backfill and conduit system.
 - c. As indicated.

1.02 STANDARD EQUIPMENT AND INSTALLATION

- A. Responsibility of Contractor (i.e. Standard Supplier): Contractor shall furnish, install and/or construct all equipment, materials and structures as defined in these Specifications and Plan, and shall include, but not be limited to the pumps and motors, MCCCs, level probe, flow meter, SCADA panel, instrument transmitters, electrical wiring, and raw water main piping. Contractor shall order and pay for all equipment. The well pumps, column, discharge head, and motor shall be owner furnished and installed by the Contractor.

SJCUD NORTHWEST WELL NO. 7
WELLHEAD AND SITE DESIGN

B. Jobsite Coordination:

1. Contractor shall be responsible for coordinating the activities at the jobsite related to the products furnished under this Contract.
2. The Contractor shall close and secure the swing gate adjacent to St. Johns Parkway at all times to prevent cattle from leaving the pasture. Additionally, the permanent cattle proof fence at the well site shall be secured at the end of each workday to ensure the health and safety of the cattle.
3. Contractor shall fully coordinate its activities with the Owner, FPL and other contractors. This includes promptly bringing to Owner's attention any conflict of coordination problem.
4. Installation and startup responsibilities.

C. Contractor is responsible for schedule management and timely notification to Owner for ordering of equipment to keep the Project on schedule.

1.03 SUBMITTALS

A. Informational:

1. Photographs:
 - a. Digital Images: Submit via FTP Site or compact disc within 7 days of being taken.

1.04 UTILITY NOTIFICATION AND COORDINATION

A. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work, if damage occurs, or if conflicts or emergencies arise during Work.

1.05 FACILITY OPERATIONS

- A. The Contractor's work schedule shall be established on the basis of working a normal work schedule including 5 days per week, single shift, 8 hours per day or 4 days per week, single shift, ten hours per day. Unless otherwise approved by the Owner, normal or general items of work shall be scheduled during the normal work schedule.
- B. Install and maintain bypass facilities and temporary connections required to keep Owner's operations on line.
- C. Do not proceed with Work affecting a facility's operation without obtaining Owner's and Engineer's advance approval of the need for and duration of such Work.

1.06 ADJACENT FACILITIES AND PROPERTIES

A. Examination:

1. After Effective Date of the Agreement and before work at sites is started, Contractor and Owner, and affected property owners, if desired by the Owner, shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.
2. Periodic re-examination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.

B. Documentation:

1. Record and submit documentation of observations made on examination inspections in accordance with paragraph Construction Photographs.
2. Upon receipt, Owner will review, sign, and return one record copy of documentation to Contractor to be kept on file in field office.
3. Such documentation shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of Contractor's operations, and is for the protection of adjacent property owners, Contractor, and Owner.

1.07 CONSTRUCTION PHOTOGRAPHS

A. Photographically document all phases of the project including preconstruction, construction progress, and post-construction.

B. Film handling and development shall be done by a commercial laboratory.

C. Owner shall have the right to select the subject matter and vantage point from which photographs are to be taken.

D. Pre-Construction and Post-Construction:

1. After Effective Date of the Agreement and before Work at Site is started, and again upon issuance of Substantial Completion, take a minimum of 10 digital pictures of the Construction Site and property adjacent to perimeter of Construction Site.
2. Particular emphasis shall be directed to structures both inside and outside the Site.
3. Format: Digital.

SJCUD NORTHWEST WELL NO. 7
WELLHEAD AND SITE DESIGN

- E. Construction Progress Photo:
 - 1. Photographically demonstrate progress of construction, showing every aspect of site and adjacent properties as well as interior and exterior of new or impacted structures.
 - 2. Weekly: Take digital pictures of the Site.
- F. Digital Images:
 - 1. Archive using a commercially-available photo management system.
 - 2. Label each disk with Project and Owner's name, and week and year images were produced.

1.08 REFERENCE POINTS AND SURVEYS

- A. Location and elevation of bench marks are shown on Drawings.
- B. Contractor's Responsibilities:
 - 1. Provide additional survey and layout required to layout the Work.
 - 2. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
 - 3. In event of discrepancy in data or staking provided by Owner, request clarification before proceeding with Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CUTTING, FITTING, AND PATCHING

- A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.
- B. Obtain prior written authorization of Owner before commencing Work to cut or otherwise alter:
 - 1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.
 - 2. Weather- or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Work of others.

- C. Refinish surfaces to provide an even finish.
 - 1. Refinish continuous surfaces to nearest intersection.
 - 2. Refinish entire assemblies.
 - 3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and Work is evident in finished surfaces.
- D. Restore existing work, Underground Facilities, and surfaces that are to remain in completed Work including concrete-embedded piping, conduit, and other utilities as specified and as shown.
- E. Make restorations with new materials and appropriate methods as specified for new Work of similar nature; if not specified, use recommended practice of manufacturer or appropriate trade association.
- F. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces and fill voids.
- G. Remove specimens of installed Work for testing when requested by Engineer.

END OF SECTION

**SECTION 01 31 19
PROJECT MEETINGS**

PART 1 GENERAL

1.01 GENERAL

- A. Project Director will schedule physical arrangements for meetings throughout progress of the Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 5 days after each meeting to participants and parties affected by meeting decisions.

1.02 PRECONSTRUCTION CONFERENCE

- A. Within 20 days after Contract Time starts to run, Contractor shall schedule a preconstruction conference. Contractor shall be prepared to discuss the following subjects, as a minimum:

1. Required schedules.
2. Status of Bonds and insurance.
3. Sequencing of critical path work items.
4. Progress payment procedures.
5. Project changes and clarification procedures.
6. Submittal list and schedule.
7. Use of Site, access, office and storage areas, security and temporary facilities.
8. Major product delivery and priorities.
9. Contractor's safety plan and representative.

- B. Attendees will include:

1. Project Director and other Owner's representatives.
2. Contractor's office representative.
3. Contractor's resident superintendent.
4. Contractor's quality control representative.
5. Subcontractors' representatives whom Contractor may desire or Engineer may request to attend.
6. If required by Owner, Engineer's representatives.
7. Others as appropriate.

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1.03 PRELIMINARY SCHEDULES REVIEW MEETING

- A. As set forth in Division 1, General Requirements.

1.04 PROGRESS MEETINGS

- A. Project Director will schedule regular weekly progress meetings at the Construction Site or at Owner's offices to review the Work progress, Progress Schedule, Schedule of Submittals, Application for Payment, contract modifications, and other matters needing discussion and resolution.
- B. Attendees will include:
1. Project Director and other Owner's representative(s), as appropriate.
 2. Contractor, Subcontractors, and Suppliers, as appropriate.
 3. Engineer's representative(s) if required by the Owner.
 4. Others as appropriate.

1.05 FACILITY STARTUP MEETINGS

- A. Schedule and attend a facility startup meeting for all well facilities.
- B. Agenda items shall include, but not be limited to, content of Facility Startup Plan, coordination needed between various parties in attendance, and potential problems associated with startup.
- C. Attendees will include:
1. Contractor.
 2. Contractor's designated quality control representative.
 3. Subcontractors and equipment manufacturer's representatives whom Contractor deems to be directly involved in facility startup.
 4. Engineer's representatives.
 5. Owner's operations personnel.
 6. Others as required by Contract Documents or as deemed necessary by Contractor.

1.06 OTHER MEETINGS

- A. In accordance with Contract Documents and as may be required by Owner and Project Director.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

PART 1 GENERAL

1.01 DEFINITIONS

- A. Action Submittal: Written and graphic information submitted by Contractor that requires Engineer's approval.
- B. Informational Submittal: Information submitted by Contractor that does not require Engineer's approval.

1.02 PROCEDURES

- A. Direct submittals to the Engineer via email. If hardcopies are required, then submit via mail to the following address.

SJCUD
Attn: Jim Overton
joverton@sjcfl.us
1205 State Road 16
St. Augustine, FL 32084

cc: Jacobs - Larry Gunn and Sherry Malloy
larry.gunn@jacobs.com and sherry.malloy@jacobs.com
200 W Forsyth Street, Suite 1520
Jacksonville, FL 32202

- B. Transmittal of Submittal:
 - 1. Contractor shall:
 - a. Review each submittal and check for compliance with Contract Documents.
 - b. Stamp each submittal with uniform approval stamp before submitting to Owner.
 - 1) Stamp to include Project name, submittal number, Specification number, Contractor's reviewer name, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with Contract Documents.
 - 2) Owner will not review submittals that do not bear Contractor's approval stamp and will return them without action.

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2. Complete, sign, and transmit with each submittal package, one Transmittal of Contractor's Submittal form attached at end of this section.
 3. Identify each submittal with the following:
 - a. Numbering and Tracking System:
 - 1) Sequentially number each submittal.
 - 2) Resubmission of submittal shall have original number with sequential alphabetic suffix.
 - b. Specification section and paragraph to which submittal applies.
 - c. Project title, Owners project number, and Engineer's project number.
 - d. Date of transmittal.
 - e. Names of Contractor, Subcontractor or Supplier, and manufacturer as appropriate.
 4. Identify and describe each deviation or variation from Contract Documents.
- C. Format:
1. Electronic PDF file format preferred.
 2. Do not base Shop Drawings on reproductions of Contract Documents.
 3. Package submittal information by individual Specification section. Do not combine different Specification sections together in submittal package, unless otherwise directed in Specification.
 4. Present in a clear and thorough manner and in sufficient detail to show kind, size, arrangement, and function of components, materials, and devices, and compliance with Contract Documents.
 5. Index with labeled tab dividers in orderly manner.
- D. Timeliness: Schedule and submit in accordance Schedule of Submittals, and requirements of individual Specification sections.
- E. Processing Time:
1. Project Director review time shall commence on Owner's receipt of submittal.
 2. Project Director will act upon Contractor's submittal and transmit response to Contractor not later than 14 days after receipt, unless otherwise specified.
 3. Resubmittals will be subject to same review time.
 4. No adjustment of Contract Times or Price will be allowed due to delays in progress of Work caused by rejection and subsequent resubmittals.

- F. Resubmittals: Clearly identify each correction or change made.
- G. Incomplete Submittals:
 - 1. Project Director will return entire submittal for Contractor's revision if preliminary review deems it incomplete.
 - 2. When any of the following are missing, submittal will be deemed incomplete:
 - a. Contractor's review stamp, completed and signed.
 - b. Transmittal of Contractor's Submittal, completed and signed.
 - c. Insufficient number of copies.
- H. Submittals not required by Contract Documents:
 - 1. Will not be reviewed and will be returned stamped "Not Subject to Review."
 - 2. Project Director will keep one copy and return all remaining copies to Contractor.

1.03 ACTION SUBMITTALS

- A. Prepare and submit Action Submittals required by individual Specification sections.
- B. Shop Drawings:
 - 1. Copies: One if electronic or three if hardcopies.
 - 2. Identify and Indicate:
 - a. Applicable Contract Drawing and Detail number, products, units and assemblies, and system or equipment identification or tag numbers.
 - b. Equipment and Component Title: Identical to title shown on Drawings.
 - c. Critical field dimensions and relationships to other critical features of Work. Note dimensions established by field measurement.
 - d. Project-specific information drawn accurately to scale.
 - 3. Manufacturer's standard schematic drawings and diagrams as follows:
 - a. Modify to delete information that is not applicable to the Work.
 - b. Supplement standard information to provide information specifically applicable to the Work.

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4. Product Data: Provide as specified in individual Specifications.
 5. Foreign Manufacturers: When proposed, include following additional information:
 - a. Names and addresses of at least two companies that maintain technical service representatives close to Project.
 - b. Complete list of spare parts and accessories for each piece of equipment.
- C. Samples:
1. Copies: Two, unless otherwise specified in individual Specifications.
 2. Preparation: Mount, display, or package Samples in manner specified to facilitate review of quality. Attach label on unexposed side that includes the following:
 - a. Manufacturer name.
 - b. Model number.
 - c. Material.
 - d. Sample source.
 3. Manufacturer's Color Chart: Units or sections of units showing full range of colors, textures, and patterns available.
 4. Full-size Samples:
 - a. Size as indicated in individual Specification section.
 - b. Prepared from same materials to be used for the Work.
 - c. Cured and finished in manner specified.
 - d. Physically identical with product proposed for use.
- D. Action Submittal Dispositions:
1. Project Director will review, mark, and stamp as appropriate, and distribute marked-up copies as noted:
 - a. Approved:
 - 1) Contractor may incorporate product(s) or implement Work covered by submittal.
 - 2) Distribution:
 - a) Two Copies furnished Owner.
 - b) One copy furnished Project Director.
 - c) One copy retained in Engineer's file.
 - d) Remaining copies returned to Contractor appropriately annotated.
 - b. Approved as Noted:
 - 1) Contractor may incorporate product(s) or implement Work covered by submittal, in accordance with Engineer's notations.

- 2) Distribution:
 - a) Two copies furnished Owner.
 - b) One copy furnished Project Director.
 - c) One copy retained in Engineer's file.
 - d) Remaining copies returned to Contractor appropriately annotated.
- c. Partial Approval, Resubmit as Noted:
 - 1) Make corrections or obtain missing portions, and resubmit.
 - 2) Except for portions indicated, Contractor may begin to incorporate product(s) or implement Work covered by submittal, in accordance with Project Director's or Engineer's notations.
 - 3) Distribution:
 - a) Two copies furnished Owner.
 - b) One copy furnished Project Director.
 - c) One copy retained in Engineer's file.
 - d) Remaining copies returned to Contractor appropriately annotated.
- d. Revise and Resubmit:
 - 1) Contractor may not incorporate product(s) or implement Work covered by submittal.
 - 2) Distribution:
 - a) One copy furnished Project Director.
 - b) One copy retained in Engineer's file.
 - c) Remaining copies returned to Contractor appropriately annotated.

1.04 INFORMATIONAL SUBMITTALS

A. General:

1. Copies: One if electronic or three if hardcopies.
2. Refer to individual Specification sections for specific submittal requirements.
3. Project Director will review each submittal. If submittal meets conditions of the Contract, Project Director will forward copies to appropriate parties. If Project Director determines submittal does not meet conditions of the Contract and is therefore considered unacceptable, Project Director will retain one copy and return remaining copies with review comments to Contractor, and require that submittal be corrected and resubmitted.

B. Application for Payment: In accordance with Section 01 29 00, Payment Procedures.

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- C. Certificates:
 - 1. General:
 - a. Provide notarized statement that includes signature of entity responsible for preparing certification.
 - b. Signed by officer or other individual authorized to sign documents on behalf of that entity.
 - 2. Welding: In accordance with individual Specification sections.
 - 3. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
 - 4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
 - 5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency or specified in individual Specification sections.
 - 6. Manufacturer's Certificate of Compliance: In accordance with Section 01 43 33, Manufacturers' Field Services.
 - 7. Manufacturer's Certificate of Proper Installation: In accordance with Section 01 43 33, Manufacturers' Field Services.
- D. Construction Photographs: In accordance with Section 01 31 13, Project Coordination, and as may otherwise be required in Contract Documents.
- E. Contract Closeout Submittals: In accordance with Section 01 77 00, Closeout Procedures.
- F. Contractor-Design Data:
 - 1. Written and graphic information.
 - 2. List of assumptions.
 - 3. List of performance and design criteria.
 - 4. Summary of loads or load diagram, if applicable.
 - 5. Calculations.
 - 6. List of applicable codes and regulations.
 - 7. Name and version of software.
 - 8. Information requested in individual Specification section.
- G. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- H. Operation and Maintenance Data: As required in Section 01 78 23, Operation and Maintenance Data.

- I. Special Guarantee: Supplier's written guarantee as required in individual Specification sections.

- J. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty Subcontractor, trade, Specialist, consultant, installer, and other professionals.
Submittals Required by Laws, Regulations, and Governing Agencies:
 - 1. Submit promptly notifications, reports, certifications, payrolls, and otherwise as may be required, directly to the applicable federal, state, or local governing agency or their representative.
 - 2. Transmit to Project Director for Owner's records one copy of correspondence and transmittals (to include enclosures and attachments) between Contractor and governing agency.

- K. Test and Inspection Reports:
 - 1. General: Shall contain signature of person responsible for test or report.
 - 2. Factory:
 - a. Identification of product and Specification section, type of inspection or test with referenced standard or code.
 - b. Date of test, Project title and number, and name and signature of authorized person.
 - c. Test results.
 - d. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
 - e. Provide interpretation of test results, when requested by Engineer.
 - f. Other items as identified in individual Specification sections.
 - 3. Field: As a minimum, include the following:
 - a. Project title and number.
 - b. Date and time.
 - c. Record of temperature and weather conditions.
 - d. Identification of product and Specification section.
 - e. Type and location of test, Sample, or inspection, including referenced standard or code.
 - f. Date issued, testing laboratory name, address, and telephone number, and name and signature of laboratory inspector.
 - g. If test or inspection deems material or equipment not in compliance with Contract Documents, identify corrective action necessary to bring into compliance.
 - h. Provide interpretation of test results, when requested by Engineer.
 - i. Other items as identified in individual Specification sections.

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- L. Testing and Startup Data: In accordance with Section 01 91 14, Equipment Testing and Facility Startup.
- M. Training Data: In accordance with Section 01 43 33, Manufacturers' Field Services.

1.05 SUPPLEMENTS

- A. The supplement listed below, following "End of Section," is part of this Specification.

- 1. Form: Transmittal of Contractor's Submittal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 38 00
AS-BUILT SUBMITTAL REQUIREMENTS

PART 1 GENERAL

1.01 GENERAL

- A. Three sets of signed and sealed black-line As-Built Drawings.
- B. Electronic Drawing File Standards:
 - 1. All As-Built drawings submitted to the St. Johns County Utility Department shall be accompanied by an electronic copy on a Compact Disc. The acceptable file formats are as follows:

CAD Drawings: DWG (AutoCAD drawing file)
GIS Layers: ARC/INFO Export file
ArcView Shape files
 - 2. Include a completed copy of the Electronic Drawing File Submittal Form with all electronic files submitted.
 - 3. All new fire hydrant locations shall be identified based upon the Florida State Plane Coordinate System. Submit an electronic file containing this data to the St. Johns County Fire-Rescue Department.
- C. "As-Built Certification by Registered Professional," must be completed by the project Engineer of Record.
- D. FDEP Water System Distribution System approval.
- E. General Information:
 - 1. Must be prepared and certified by either a Florida Registered Land Surveyor or a Florida Registered Engineer.
 - 2. Each sheet must be labeled "AS-BUILT" in one inch high bold letters in the bottom right hand corner.
 - 3. Name, address, registration number of Florida Registered Land Surveyor or Florida Registered Engineer responsible for preparing "AS-BUILT."
 - 4. North Arrow.
 - 5. Street names.
 - 6. Easements as shown on approved paving and drainage drawings must be depicted on "AS-BUILT."
 - 7. Location, elevation and datum of the Benchmark used.

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1.02 AS-BUILT DRAWING REQUIREMENTS

- A. As-built drawings shall be based on all engineering design drawings as released for construction, and shall include all detail sheets and depict any deviations. Re-drafting for the purpose of As-builts will not be accepted unless specifically approved by the owner.
- B. The following dimensional references must be depicted on As-built drawings:
 - 1. Station Numbers with offsets.
 - 2. Ties.
 - 3. Lot Numbers.
 - 4. Street Names.
 - 5. North Arrow.
 - 6. Scale.
- C. Locations, elevations, sizes, types, and materials of the following must be accurately shown and labeled (as applicable) on the As-built drawings:
 - 1. Manholes (include specialty lining material, pipe invert, manhole rim and bottom elevations).
 - 2. Water and Force Main Valves.
 - 3. Water and Sewer services.
 - 4. Fire Hydrants and all associated structures.
 - 5. Fittings.
 - 6. Electrical Wiring and conduits (power and control).
- D. All water and sewer mains must be identified on the as-built drawings by their size, material, and DR/SDR classification. Horizontal locations and top of pipe elevations must also be labeled every 100 linear feet.
- E. The requirements listed in the “St. Johns County Development Services - As-Built Survey Requirements and Acceptance Procedures” section of this Contract and Specification Book will also apply.
- F. Electronic file requirements are listed on the documents titled “St. Johns County Utility Department Electronic File Standards” and “St. Johns County Utility Department Electronic File Submittal Form” both of which are included. The Contractor must comply with and complete the Electronic File Submittal form which is to be submitted with the electronic as-built files.

1.03 SUPPLEMENTS

A. The supplement listed below, following “END OF SECTION,” is part of this Specification.

1. Electronic Drawing File Standards.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**ST. JOHNS COUNTY UTILITY DEPARTMENT
ELECTRONIC DRAWING FILE STANDARDS**



All AS-Built drawings submitted to the St. Johns County Utility Department shall be accompanied by an electronic copy on an IBM PC compatible 3.5" floppy diskette or compact disk (CD). The electronic files must meet the following requirements:

File Format

The acceptable file formats are as follows:

CAD drawings DWG (AutoCAD drawing file)
 DXF (Drawing Interchange Format)

GIS layers ARC/INFO Export file
 ArcView Shape files

Coordinate System

All Plan drawings and GIS layer files must be submitted in the following projected coordinate system:

**State Plane Feet
NAD 83
Florida East Zone (901)**

Layering Format

All Utility features on Plan drawings must be separated from other drawing features and placed on individual layers as follows:

Water mains
Water service laterals
Water point features (fire hydrants, meters, valves, fittings, etc.)
Water text (size and material labels, dimensions, notes, etc.)
Water as-built markups
Sewer pressure mains
Sewer gravity mains
Sewer service laterals
Sewer point features (lift stations, manholes, valves, fittings, etc.)
Sewer text (size and material labels, dimensions, notes, etc.)
Sewer as-built markups

Specific layer names are not required, but a list of layer names for the feature/entity layers listed above must be included with the submittal.

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A completed Electronic Data Submittal form must accompany all drawing files submitted to the Utility Department.

ST. JOHNS COUNTY UTILITY DEPARTMENT
ELECTRONIC DRAWING FILE
SUBMITTAL FORM



Include a completed copy of this form with ALL electronic files submitted.

Company Name: _____ Project: _____
File Name(s): _____

Contact Person:

Name: _____ Phone: _____
Title: _____ Email: _____

Format: ___ DWG (AutoCAD drawing file)
 Version: _____
 ___ E00 (ARC/INFO export file)
 ___ SHP (ArcView shape file)
 Include all files (.shp, .shx, .dbf, etc.)

Layer Identification for Plan drawing sheets:

<u>Layer Name</u>	<u>Utility features/entities</u>
_____	Water mains
_____	Water service laterals
_____	Water point features (fire hydrants, meters, valves, fittings, etc.)
_____	Water text (size and material labels, dimensions, notes, etc.)
_____	Water as-built markups
_____	Sewer pressure mains
_____	Sewer gravity mains
_____	Sewer service laterals
_____	Sewer point features (lift stations, manholes, valves, fittings, etc.)
_____	Sewer text (size and material labels, dimensions, notes, etc.)
_____	Sewer as-built markups

For technical questions regarding this request please contact:

Tom Tibbitts
Utility Information Coordinator
St. Johns County Utility Department
(904) 209-2636
Email: ttibbitts@sjcfl.us

SECTION 01 42 13
ABBREVIATIONS AND ACRONYMS

PART 1 GENERAL

1.01 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES

- A. Reference to standards and specifications of technical societies and reporting and resolving discrepancies associated therewith shall be as required herein and in the individual Specification sections. Any reference to a particular standard shall be taken to mean the most recently published revision unless otherwise specified in the Contract Documents.
- B. Work specified by reference to published standard or specification of government agency, technical association, trade association, professional society or institute, testing agency, or other organization shall meet requirements or surpass minimum standards of quality for materials and workmanship established by designated standard or specification.
- C. Where so specified, products or workmanship shall also meet or exceed additional prescriptive or performance requirements included within Contract Documents to establish a higher or more stringent standard of quality than required by referenced standard.
- D. Where two or more standards are specified to establish quality, product and workmanship shall meet or exceed requirements of most stringent.
- E. Where both a standard and a brand name are specified for a product in Contract Documents, proprietary product named shall meet or exceed requirements of specified reference standard.
- F. Copies of standards and specifications of technical societies:
 - 1. Copies of applicable referenced standards have not been bound in these Contract Documents.
 - 2. Where copies of standards are needed by Contractor, obtain a copy or copies directly from publication source and maintain in an orderly manner at the Site as Work Site records, available to Contractor's personnel, Subcontractors, Owner, Project Director, and Engineer.

1.02 ABBREVIATIONS

A. Abbreviations for trade organizations and government agencies: Following is a list of construction industry organizations and government agencies to which references may be made in the Contract Documents, with abbreviations used.

1.	AA	Aluminum Association
2.	AABC	Associated Air Balance Council
3.	AAMA	American Architectural Manufacturers Association
4.	AASHTO	American Association of State Highway and Transportation Officials
5.	ABMA	American Bearing Manufacturers' Association
6.	ACI	American Concrete Institute
7.	AEIC	Association of Edison Illuminating Companies
8.	AGA	American Gas Association
9.	AGMA	American Gear Manufacturers' Association
10.	AI	Asphalt Institute
11.	AISC	American Institute of Steel Construction
12.	AISI	American Iron and Steel Institute
13.	AITC	American Institute of Timber Construction
14.	ALS	American Lumber Standards
15.	AMCA	Air Movement and Control Association
16.	ANSI	American National Standards Institute
17.	APA	APA – The Engineered Wood Association
18.	API	American Petroleum Institute
19.	APWA	American Public Works Association
20.	ARI	Air-Conditioning and Refrigeration Institute
21.	ASA	Acoustical Society of America
22.	ASAE	American Society of Agricultural Engineers
23.	ASCE	American Society of Civil Engineers
24.	ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
25.	ASME	American Society of Mechanical Engineers
26.	ASNT	American Society for Nondestructive Testing
27.	ASSE	American Society of Sanitary Engineering
28.	ASTM	ASTM International
29.	AWI	Architectural Woodwork Institute
30.	AWPA	American Wood Preservers' Association
31.	AWPI	American Wood Preservers' Institute
32.	AWS	American Welding Society
33.	AWWA	American Water Works Association
34.	BHMA	Builders Hardware Manufacturers' Association
35.	CBM	Certified Ballast Manufacturer

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36.	CDA	Copper Development Association
37.	CGA	Compressed Gas Association
38.	CISPI	Cast Iron Soil Pipe Institute
39.	CMAA	Crane Manufacturers' Association of America
40.	CRSI	Concrete Reinforcing Steel Institute
41.	CS	Commercial Standard
42.	CSA	Canadian Standards Association
43.	CSI	Construction Specifications Institute
44.	DIN	Deutsches Institut für Normung e.V.
45.	DIPRA	Ductile Iron Pipe Research Association
46.	EIA	Electronic Industries Alliance
47.	EJCDC	Engineers Joint Contract Documents' Committee
48.	ETL	Electrical Test Laboratories
49.	FAA	Federal Aviation Administration
50.	FCC	Federal Communications Commission
51.	FDA	Food and Drug Administration
52.	FEMA	Federal Emergency Management Agency
53.	FIPS	Federal Information Processing Standards
54.	FM	Factory Mutual
55.	Fed. Spec.	Federal Specifications (FAA Specifications)
56.	FS	Federal Specifications and Standards (Technical Specifications)
57.	GA	Gypsum Association
58.	GANA	Glass Association of North America
59.	HI	Hydraulic Institute
60.	HMI	Hoist Manufacturers' Institute
61.	IBC	International Building Code
62.	ICBO	International Conference of Building Officials
63.	ICC	International Code Council
64.	ICEA	Insulated Cable Engineers' Association
65.	IFC	International Fire Code
66.	IEEE	Institute of Electrical and Electronics Engineers, Inc.
67.	IESNA	Illuminating Engineering Society of North America
68.	IFI	Industrial Fasteners Institute
69.	IGMA	Insulating Glass Manufacturer's Alliance
70.	IMC	International Mechanical Code
71.	INDA	Association of the Nonwoven Fabrics Industry
72.	IPC	International Plumbing Code
73.	ISA	Instrumentation, Systems, and Automation Society
74.	ISO	International Organization for Standardization

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75.	ITL	Independent Testing Laboratory
76.	JIC	Joint Industry Conferences of Hydraulic Manufacturers
77.	MIA	Marble Institute of America
78.	MIL	Military Specifications
79.	MMA	Monorail Manufacturers' Association
80.	NAAMM	National Association of Architectural Metal Manufacturers
81.	NACE	NACE International
82.	NBGQA	National Building Granite Quarries Association
83.	NEBB	National Environmental Balancing Bureau
84.	NEC	National Electrical Code
85.	NECA	National Electrical Contractor's Association
86.	NEMA	National Electrical Manufacturers' Association
87.	NESC	National Electrical Safety Code
88.	NETA	InterNational Electrical Testing Association
89.	NFPA	National Fire Protection Association
90.	NHLA	National Hardwood Lumber Association
91.	NICET	National Institute for Certification in Engineering Technologies
92.	NIST	National Institute of Standards and Technology
93.	NRCA	National Roofing Contractors Association
94.	NRTL	Nationally Recognized Testing Laboratories
95.	NSF	NSF International
96.	NSPE	National Society of Professional Engineers
97.	NTMA	National Terrazzo and Mosaic Association
98.	NWWDA	National Wood Window and Door Association
99.	OSHA	Occupational Safety and Health Act (both Federal and State)
100.	PCI	Precast/Prestressed Concrete Institute
101.	PEI	Porcelain Enamel Institute
102.	PPI	Plastic Pipe Institute
103.	PS	Product Standards Section-U.S. Department of Commerce
104.	RMA	Rubber Manufacturers' Association
105.	RUS	Rural Utilities Service
106.	SAE	Society of Automotive Engineers
107.	SDI	Steel Deck Institute
108.	SDI	Steel Door Institute
109.	SJI	Steel Joist Institute
110.	SMACNA	Sheet Metal and Air Conditioning Contractors National Association
111.	SPI	Society of the Plastics Industry
112.	SSPC	The Society for Protective Coatings

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113. SWI	Steel Window Institute
114. TEMA	Tubular Exchanger Manufacturers' Association
115. TCA	Tile Council of North America
116. TIA	Telecommunications Industry Association
117. UBC	Uniform Building Code
118. UFC	Uniform Fire Code
119. UL	Underwriters Laboratories Inc.
120. UMC	Uniform Mechanical Code
121. USBR	U.S. Bureau of Reclamation
122. WCLIB	West Coast Lumber Inspection Bureau
123. WIC	Wood Institute of California
124. WWPA	Western Wood Products Association

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 43 33
MANUFACTURERS' FIELD SERVICES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Person-Day: One person for 8 hours within regular Contractor working hours.

1.02 SUBMITTALS

- A. Informational Submittals:

1. Training Schedule: Submit, in accordance with requirements of this specification, not less than 21 days prior to start of equipment installation and revise as necessary for acceptance.

1.03 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

- A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified elsewhere.
- B. Representative subject to acceptance by Owner. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 FULFILLMENT OF SPECIFIED MINIMUM SERVICES

- A. Furnish manufacturers' services when required by an individual specification section, to meet the requirements of this section.
- B. Where time is necessary in excess of that stated in the Specifications for manufacturers' services, or when a minimum time is not specified, the time required to perform the specified services shall be considered incidental.
- C. Schedule manufacturer' services to avoid conflict with other onsite testing or other manufacturers' onsite services.

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- D. Determine, before scheduling services, that all conditions necessary to allow successful testing have been met.
- E. Only those days of service approved by Project Director will be credited to fulfill the specified minimum services.
- F. When specified in individual specification sections, manufacturer's onsite services shall include:
 - 1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of Contractor's assembly, erection, installation or application procedures.
 - 2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish Manufacturer's Certificate of Proper Installation.
 - 3. Providing, on a daily basis, copies of all manufacturers' representatives field notes and data to Project Director.
 - 4. Revisiting the Site as required to correct problems and until installation and operation are acceptable to Project Director.
 - 5. Resolution of assembly or installation problems attributable to, or associated with, respective manufacturer's products and systems.
 - 6. Assistance during functional and performance testing, and facility startup and evaluation.
 - 7. Training of Owner's personnel in the operation and maintenance of respective product as required.
 - 8. Additional requirements may be specified elsewhere.

3.02 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

- A. When so specified, a Manufacturer's Certificate of Compliance, a copy of which is attached to this section, shall be completed in full, signed by the entity supplying the product, material, or service, and submitted prior to shipment of product or material or the execution of the services.
- B. Project Director or Engineer may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.
- C. Such form shall certify that the proposed product, material, or service complies with that specified. Attach supporting reference data, affidavits, and certifications as appropriate.
- D. May reflect recent or previous test results on material or product, if acceptable to Project Director or Engineer.

3.03 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

- A. When so specified, a Manufacturer's Certificate of Proper Installation form, a copy of which is attached to this section, shall be completed and signed by the equipment manufacturer's representative.
- B. Such form shall certify that the signing party is a duly authorized representative of the manufacturer, is empowered by the manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to assure that the equipment is complete and operational.

3.04 TRAINING

A. General:

- 1. Furnish manufacturers' representatives for detailed classroom and hands-on training to Owner's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable Specifications.
- 2. Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with Owner, and familiar with operation and maintenance manual information specified in Section 01 78 23, Operation and Maintenance Data.
- 3. Manufacturer's representative shall be familiar with facility operation and maintenance requirements as well as with specified equipment.
- 4. Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.

B. Training Schedule:

- 1. List specified equipment and systems that require training services and show:
 - a. Respective manufacturer.
 - b. Estimated dates for installation completion.
 - c. Estimated training dates.
- 2. Allow for multiple sessions when several shifts are involved.
- 3. Adjust schedule to ensure training of appropriate personnel as deemed necessary by Owner, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.
- 4. Coordinate with Division 1, General Requirements, and Section 01 91 14, Equipment Testing and Facility Startup.

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- C. Lesson Plan: When manufacturer or vendor training of Owner personnel is specified, prepare a lesson plan for each required course containing the following minimum information:
1. Title and objectives.
 2. Recommended attendees (e.g., managers, engineers, operators, maintenance).
 3. Course description, outline of course content, and estimated class duration.
 4. Format (e.g., lecture, self-study, demonstration, hands-on).
 5. Instruction materials and equipment requirements.
 6. Resumes of instructors providing the training.
- D. Pre-startup Training:
1. Coordinate training sessions with Owner's operating personnel and manufacturers' representatives, and with submission of operation and maintenance manuals in accordance with Section 01 78 23, Operation and Maintenance Data.
 2. Complete at least 14 days prior to beginning of facility startup.
- E. Post-startup Training: If required in Specifications, furnish and coordinate training of Owner's operating personnel by respective manufacturer's representatives.

3.05 SUPPLEMENTS

- A. The supplements listed below, following "End of Section", are part of this Specification.
1. Form: Manufacturer's Certificate of Compliance.
 2. Form: Manufacturer's Certificate of Proper Installation.

END OF SECTION

MANUFACTURER’S CERTIFICATE OF COMPLIANCE

OWNER: _____ PRODUCT, MATERIAL, OR SERVICE
SUBMITTED:
PROJECT NAME:
PROJECT NO:

Comments: _____

I hereby certify that the above-referenced product, material, or service called for by the contract for the named project will be furnished in accordance with all applicable requirements. I further certify that the product, material, or service are of the quality specified and conform in all respects with the contract requirements, and are in the quantity shown.

Date of Execution: _____, 20__

Manufacturer: _____

Manufacturer’s Authorized Representative (*print*): _____

(Authorized Signature)

MANUFACTURER’S CERTIFICATE OF PROPER INSTALLATION

OWNER _____ EQPT SERIAL NO: _____
EQPT TAG NO: _____ EQPT/SYSTEM: _____
PROJECT NO: _____ SPEC. SECTION: _____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- Installed in accordance with Manufacturer’s recommendations.
- Inspected, checked, and adjusted.
- Serviced with proper initial lubricants.
- Electrical and mechanical connections meet quality and safety standards.
- All applicable safety equipment has been properly installed.
- Functional tests.
- System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments: _____

I, the undersigned Manufacturer’s Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date: _____, 20__

Manufacturer: _____

By Manufacturer’s Authorized Representative: _____
(Authorized Signature)

SECTION 01 45 16.13
CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. D3740, Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - b. E329, Use in the Evaluation of Testing and Inspection Agencies as Used in Construction.

1.02 OWNER'S QUALITY ASSURANCE

- A. All Work is subject to Owner's quality assurance inspection and testing at all locations and at all reasonable times before acceptance to ensure strict compliance with the terms of the Contract Documents.
- B. Owner's quality assurance inspections and tests are for the sole benefit of Owner and do not:
 - 1. Relieve Contractor of responsibility for providing adequate quality control measures;
 - 2. Relieve Contractor of responsibility for damage to or loss of the material before acceptance;
 - 3. Constitute or imply acceptance; or
 - 4. Affect the continuing rights of Owner after acceptance of the completed Work.
- C. The presence or absence of a quality assurance inspector does not relieve Contractor from any Contract requirement.
- D. Promptly furnish all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by Engineer.
- E. Owner may charge Contractor for any additional cost of inspection or test when Work is not ready at the time specified by Contractor for inspection or test, or when prior rejection makes re-inspection or retest necessary. Quality assurance inspections and tests will be performed in a manner that will not unnecessarily delay the Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Maintain an adequate inspection system and perform such inspections as will ensure that the Work conforms to the Contract Documents.
- B. Maintain complete inspection records and make them available at all times to Owner and Engineer.
- C. The quality control system shall consist of plans, procedures, and organization necessary to produce an end product that complies with the Contract Documents. The system shall cover all construction and demolition operations, both onsite and offsite, including Work by subcontractors, fabricators, suppliers and purchasing agents, and shall be keyed to the proposed construction sequence.

3.02 SUBMITTAL QUALITY CONTROL

- A. Submittals shall be as specified in Section 01 33 00, Submittal Procedures. The Contractor shall be responsible for certifying that all submittals are in compliance with the Contract requirements. Owner will furnish copies of test report forms upon request by Contractor. Contractor may use other forms as approved.

3.03 TESTING QUALITY CONTROL

- A. Testing Procedure:
 - 1. Perform tests specified or required to verify that control measures are adequate to provide a product which conforms to Contract requirements. Perform the following activities and record the following data:
 - a. Verify testing procedures comply with contract requirements.
 - b. Verify facilities and testing equipment are available and comply with testing standards.
 - c. Check test instrument calibration data against certified standards.
 - d. Verify recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

- e. Documentation:
- 1) Record results of all tests taken, both passing and failing.
 - 2) Include specification paragraph reference, location where tests were taken, and the sequential control number identifying the test.
 - 3) Actual test reports may be submitted later, if approved by Engineer, with a reference to the test number and date taken.
 - 4) Provide directly to Engineer an information copy of tests performed by an offsite or commercial test facility. Test results shall be signed by an engineer registered in the state where the tests are performed.
 - 5) Failure to submit timely test reports, as stated, may result in nonpayment for related Work performed and disapproval of the test facility for this Contract.

- B. Testing Laboratories: Laboratory facilities, including personnel and equipment, utilized for testing soils, concrete, asphalt and steel shall meet criteria detailed in ASTM D3740 and ASTM E329, and be accredited by the American Association of Laboratory Accreditation (AALA), National Institute of Standards and Technology (NIST), National Voluntary Laboratory Accreditation Program (NVLAP), the American Association of State Highway and Transportation Officials (AASHTO), or other approved national accreditation authority. Personnel performing concrete testing shall be certified by the American Concrete Institute (ACI).

3.04 COMPLETION INSPECTION

- A. The Owner and/or Engineer shall conduct an inspection of the Work at the completion of all Work or any milestone established by a completion time stated in the Contract.
- B. Punchlist:
1. The Owner and Engineer shall develop a punchlist of items which do not conform to the Contract requirements.
 2. The Engineer shall make a second inspection to ascertain that all deficiencies have been corrected and so notify the Owner.
 3. These inspections and any deficiency corrections required will be accomplished within the time stated for completion of the entire Work or any particular increment thereof if the Project is divided into increments by separate completion dates.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of Nurserymen (AAN): American Standards for Nursery Stock.
 2. Federal Emergency Management Agency (FEMA).
 3. National Fire Prevention Association (NFPA): 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 4. Telecommunications Industry Association (TIA); Electronic Industries Alliance (EIA): 568B, Commercial Building Telecommunications Cabling Standard.
 5. U.S. Department of Agriculture (USDA): Urban Hydrology for Small Watersheds.
 6. U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years.

1.02 SUBMITTALS

- A. Informational Submittals:
1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
 2. Temporary Control Submittals: Plan for disposal of waste materials and intended haul routes.

1.03 MOBILIZATION

- A. Mobilization shall normally include, but not be limited to, these principal items:
1. Obtaining required permits.
 2. Where required, installing temporary construction power, wiring, and lighting facilities.
 3. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations, and governing agencies.

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4. Posting OSHA required notices and establishing safety programs and procedures.
 5. Having Contractor's superintendent at Site full time.
- B. No area is available at the construction Site or on Owner's property for Contractor's temporary facilities.

1.04 PROTECTION OF WORK AND PROPERTY

- A. Comply with Owner's safety rules while on Owner's property.
- B. Keep Owner informed of serious onsite accidents and related claims.
- C. Use of Explosives: No blasting or use of explosives will be allowed onsite.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 TEMPORARY UTILITIES

- A. Power: Electric power is not available at the Site.
- B. Lighting: Provide temporary lighting to meet applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.
- C. Water:
 1. Water will not be available at the well sites.
 2. Provide temporary facilities and piping required to bring water to point of use and remove when no longer needed.
- D. Sanitary and Personnel Facilities: Provide and maintain facilities for Contractor's employees, Subcontractors, and all other onsite employers' employees. Service, clean, and maintain facilities and enclosures.
- E. Telephone Service: Contractor shall provide own phone service at Site. Onsite telephone service is not available.
- F. Fire Protection: Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of NFPA 241.

3.02 PROTECTION OF WORK AND PROPERTY

A. General:

1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to the adjacent property owner.
2. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered along line of the Work, unless other arrangements satisfactory to owners of said utilities have been made.
3. Where completion of the Work requires temporary or permanent removal or relocation of an existing utility or coordinate all activities with owner of said utility and perform all work to their satisfaction.
4. Protect, shore, brace, support, and maintain underground pipes, conduits, drains, and other underground utility construction uncovered or otherwise affected by construction operations.
5. In areas where Contractor's operations are adjacent to or near a utility, such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by Contractor.
6. Notify property owners and utility offices that may be affected by construction operation at least 2 days in advance: Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to Contractor's operation, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
7. Maintain original Site drainage wherever possible.

B. Site Security: The construction Site is located in a 200'x140' fenced area. Provide and maintain additional temporary security fences as necessary to protect the Work and Contractor-furnished products not yet installed.

C. Existing Structures:

1. Where Contractor contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with Contractor's operations, obtain approval of property owner and Project Director.
2. Replace items removed in their original location and a condition equal to or better than original.

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D. Waterways:

1. Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.
2. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.

E. Archaeological Finds:

1. If prehistoric artifacts such as pottery or ceramics, stone tools or metal implements, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, the Contractor shall cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries.
2. The Contractor shall immediately contact the Project Director concerning the discovery. The Project Director, in concert with the Owner, will contact the Florida Department of State, Division of Historical Resources, Compliance and Review at (850) 245-6333 or (800) 847-7278, as well as the appropriate funding agency office.
3. The Contractor's project activities shall not resume until directed to do so by the Project Director.
4. In the event that unmarked human remains are encountered during the permitted activities, Contractor shall immediately stop work and notify proper authorities in accordance with Section 872.05, *Florida Statute*.

3.03 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air pollution from construction operations.
2. Burning of waste materials, rubbish, or other debris will not be permitted on or adjacent to Site.

3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.
 4. Provide and maintain temporary dust-tight partitions, bulkheads, or other protective devices during construction to permit normal operation of existing facilities. Construct partitions of plywood, insulating board, plastic sheets, or similar material. Construct partitions in such a manner that dust and dirt from demolition and cutting will not enter other parts of existing building or facilities. Remove temporary partitions as soon as need no longer exists.
- B. Noise Control: Provide required acoustical barriers so noise emanating from tools or equipment will not exceed legal noise levels.
- C. Water Pollution Control:
1. Prior to commencing excavation and construction, obtain Project Director's agreement with detailed plans showing procedures intended to handle and dispose groundwater and stormwater flow, including dewatering pump discharges.
 2. Comply with procedures outlined in U.S. Environmental Protection Agency manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning" and "Implementation, Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity," and "Erosion and Sediment Control-Surface Mining in Eastern United States."
 3. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.
- D. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

3.04 ACCESS ROADS AND DETOURS

- A. Construction site is accessible improved construction access road.

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3.05 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.

3.06 VEHICULAR TRAFFIC

- A. Comply with Laws and Regulations regarding closing or restricting use of public streets or highways. No public or private road shall be closed, except by written permission of proper authority. Assure the least possible obstruction to traffic and normal commercial pursuits.
- B. Conduct the Work to interfere as little as possible with public travel, whether vehicular or pedestrian.
- C. Whenever it is necessary to cross, close, or obstruct roads, driveways, and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.

3.07 CLEANING DURING CONSTRUCTION

- A. In accordance with Contract Conditions, as may be specified in other Specification sections, and as required herein.
- B. At least weekly, pick up all debris and dispose.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least at weekly intervals, dispose of such waste materials, debris, and rubbish offsite.

END OF SECTION

SECTION 01 57 13
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 WORK OF THIS SECTION

- A. This section covers work necessary for stabilization of soil to prevent erosion during and after construction and land disturbing activities. The work shall include the furnishing of all labor, materials, tools, and equipment to perform the work and services necessary as herein specified and as indicated on Drawings. This shall include installation, maintenance, and final removal of all temporary soil erosion and sediment control measures.
- B. The minimum areas requiring soil erosion and sediment control measures are indicated on Drawings. The right is reserved to modify the use, location, and quantities of soil erosion and sediment control measures based on activities of the Contractor and as the Project Director considers to be to the best interest of the Owner.
- C. See additional information noted on Drawings.

1.02 GENERAL

- A. All activities shall conform to the Standard Erosion Control Specification: Florida Department of Transportation Design Standard, latest version; FDEP construction permit; and the Drawings. In the event of a conflict, the more stringent requirement shall apply.
- B. Soil erosion stabilization and sedimentation control consist of the following elements:
 - 1. Maintenance of existing permanent or temporary storm drainage piping and channel systems, as necessary.
 - 2. Construction of new permanent and temporary storm drainage piping and channel systems, as necessary.
 - 3. Construction of temporary erosion control facilities such as silt fences, check dams, etc.

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4. Topsoil and Seeding:
 - a. Placement and maintenance of Temporary Seeding on all areas disturbed by construction.
 - b. Placement of permanent topsoil, fertilizer, and seed, etc., in all areas not occupied by structures or pavement, unless shown otherwise.
 5. Soil Stabilization Seeding: Placement of fertilizer and seed, etc., in areas as specified hereinafter.
- C. Permanent stockpiling of material is not permitted. Sediment transport and erosion from working stockpiles shall be controlled and restricted from moving beyond the immediate stockpile area by construction of temporary toe-of-slope ditches and accompanying silt fences, as necessary. The Contractor shall keep these temporary facilities in operational condition by regular cleaning, regrading, and maintenance. Stockpiles remaining in place longer than 14 calendar days shall be removed from the construction site.
- D. The Contractor shall maintain all elements of the Soil Erosion Stabilization and Sedimentation Control systems and facilities to be constructed during this Project for the duration of his activities on this Project. Formal inspections made jointly by the Contractor and the Project Director shall be conducted every 2 weeks to evaluate the Contractor's conformance to the requirements of both these Specifications and St. John's County Regulations.
- E. All silt traps shall be cleaned of collected sediment after every storm or as determined from the biweekly inspections. Cleaning shall be done in a manner that will not direct the sediment into the storm drain piping system. Removed sediment shall be taken to an area selected by the Project Director where it can be cleaned of sticks and debris, then allowed to dry. Final sediment and debris disposal shall be offsite.
- F. Replacement or repair of failed or overloaded silt fences, check dams, or other temporary erosion control devices shall be accomplished by the Contractor within 2 days after receiving written notice from the Project Director.
- G. Unpaved earth drainage ditches shall be regraded as needed to maintain original grade and remove sediment buildup. If a ditch becomes difficult to maintain, the Contractor shall cooperate with the Project Director and install additional erosion control devices such as check dams, temporary paving, or silt fences as directed by the Project Director.

- H. If the Contractor has not complied with any of the above maintenance efforts to the satisfaction of the Project Director within 2 working days after receiving written notification from the Project Director, the Owner shall have the prerogative of engaging others to perform any needed maintenance or cleanup, including removal of accumulated sediment at constructed erosion control facilities, and deduct from the Contractor's monthly partial payment the costs for such efforts plus a \$500 administration fee.

1.03 SUBMITTALS

- A. Submittals shall be made in accordance with Section 01 33 00, Submittal Procedures.
- B. In addition, the Contractor shall provide the following specific information:
 - 1. Certificates of inspection of seed by state or federal authorities and copies of delivery invoices or other proof of quantities of fertilizer.
 - 2. Manufacturer's certificate of compliance attesting that the geotextile meets the requirements of these Specifications.

PART 2 PRODUCTS

2.01 PERMANENT SEED

- A. Bahia grass seed with a minimum pure seed content of 95 percent with a minimum germination of 85 percent.

2.02 SOIL STABILIZATION AND TEMPORARY SEED

- A. October 15 through February 28: Annual type ryegrass seed with a minimum pure seed content of 95 percent with a germination of 90 percent. March 1 through October 14: Millet with a minimum pure seed content of 95 percent with a germination of 90 percent.

2.03 TOPSOIL

- A. Topsoil shall be as specified under Section 31 23 23, Fill and Backfill.

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2.04 FERTILIZER

- A. Fertilizer shall be commercial, chemical type, uniform in composition, free-flowing, conforming to state and federal laws, and suitable for application with equipment designed for that purpose.
- B. Fertilizer shall have a minimum percentage of plant food by weight for the following: Permanent fertilizer mix shall be 10 percent nitrogen, 10 percent phosphoric acid, and 10 percent potash.

2.05 STRAW MULCH

- A. Threshed straw of oats, wheat, barley, or rye, free from seed of noxious weeds, or clean salt hay.

PART 3 EXECUTION

3.01 GENERAL

- A. The Contractor shall install erosion and sediment control measures and maintain in accordance with the Drawings. The sequence of construction shown on Drawings is made a part of these Contract Documents.
- B. The Contractor shall provide and maintain Temporary Seeding at all times.

3.02 SEEDING

- A. General:
 - 1. The Contractor shall give at least 3 days notice to the Project Director prior to seeding to allow the Owner to inspect the prepared areas. The Contractor shall rework any areas not approved for seeding to the Owner's satisfaction.
 - 2. The Contractor shall keep the Project Director advised of schedule of operations.
 - 3. Seed shall be clean, delivered in original unopened packages and bearing an analysis of the contents, guaranteed 95 percent pure with minimum germination rate of 85 percent.
- B. Schedules:
 - 1. Seeding shall be performed in accordance with the following schedule:
 - a. Summer Seeding: Between March 15 and June 15, or September 1 to November 15.
 - b. Winter Seeding: All other times of year, except when weather conditions prohibit further construction operations as determined by the Project Director.

C. Soil Stabilization and Temporary Seeding:

1. Soil stabilization seeding shall consist of the application of the following materials in quantities as further described herein for disturbed areas left inactive for more than 14 days.
 - a. Lime.
 - b. Fertilizer.
 - c. Seed.
 - d. Mulch.
 - e. Maintenance.
2. Hydroseeding will be permitted as an alternative method of applying seed and associated soil conditioning agents described above. Should the Contractor elect to apply soil stabilization seeding by hydroseeding methods, he shall submit his operational plan and methods to the Engineer.
3. Temporary Seeding is to be placed and maintained over all disturbed areas prior to Permanent Seeding. Maintain Temporary Seeding until such time as areas are approved for Permanent Seeding. As a minimum, maintenance shall include the following:
 - a. Fix-up and reseedling of bare areas or redisturbed areas.
 - b. Mowing for stands of grass or weeds exceeding 6 inches in height.

D. Topsoil and Permanent Seeding:

1. Topsoil and Permanent Seeding shall consist of the application of the following materials in quantities as further described herein:
 - a. 4-inch depth of topsoil.
 - b. Lime.
 - c. Fertilizer.
 - d. Permanent seed mix.
 - e. Mulch.
2. Topsoil is to be placed over all disturbed areas that are not surfaced with concrete, asphalt, or pavers.
3. Preparation:
 - a. After rough grading is completed and reviewed by the Project Director, Contractor shall spread topsoil as hereinbefore specified over all areas to receive Permanent Seeding to a minimum compacted depth of 6 inches with surface elevations as shown. Loosen the finished surface to a depth of 2 inches and leave in smooth condition, free from depressions or humps, ready for seeding.
 - b. Finish Grading:
 - 1) Contractor shall rake the topsoiled area to a uniform grade, so that all areas drain as indicated on the grading plan.

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- 2) Contractor shall remove all trash and stones exceeding 1 inch in diameter from area to a depth of 2 inches.
4. Permanent Seed:
 - a. After soil has been scarified, apply seed and other products at the rate and proportion specified below:
 - 1) Seed Mix: 150 pounds per acre.
 - 2) 10-10-10 Fertilizer: 1,000 pounds per acre.
 - 3) Lime: 3 tons per acre.
 - 4) Water: As necessary.
5. Maintenance:
 - a. Maintenance Period: Contractor shall begin maintenance immediately after each portion of permanent grass is planted and continue for 8 weeks after all planting is completed.
 - b. Maintenance Operations: Contractor shall water to keep surface soil moist. Repair washed out areas by filling with topsoil, liming, fertilizing, and seeding. Replace mulch on banks when washed or blown away. Mow to 2 inches after grass reaches 3 inches in height, and mow frequently enough to keep grass from exceeding 3-1/2 inches. Weed by local spot application of selective herbicide only after first planting season when grass is established.
6. Guarantee:
 - a. If, at the end of the 8-week maintenance period, a satisfactory stand of grass has not been produced, the Contractor shall renovate and reseed the grass or unsatisfactory portions thereof immediately, or, if after October 15 during the next planting season. If a satisfactory stand of grass develops by July 1 of the following year, it will be accepted. If it is not accepted, a complete replanting will be required during the planting season meeting all of the requirements specified under paragraph Permanent Seed.
 - b. A satisfactory stand is defined as grass or section of grass that has a substantial establishment of new grass, strongly rooted, and uniformly green in appearance from a distance of 50 feet. No noticeable thin or bare areas as determined by the Project Director.

END OF SECTION

**SECTION 01 61 00
COMMON PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 DEFINITIONS

A. Products:

1. New items for incorporation in the Work, whether purchased by Contractor or Owner for the Project, or taken from previously purchased stock, and may also include existing materials or components required for reuse.
2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in construction industry.
3. Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of the date of the Contract Documents.

1.02 PREPARATION FOR SHIPMENT

- A. When practical, factory-assemble products. Mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project and Contractor, equipment number, and approximate weight. Include complete packing list and bill-of-materials with each shipment.
- C. Extra Materials, Special Tools, Test Equipment, and Expendables:
 1. Furnish as required by individual Specifications.
 2. Schedule:
 - a. Ensure that shipment and delivery occur concurrent with shipment of associated equipment.
 - b. Transfer to Owner shall occur immediately subsequent to Contractor's acceptance of equipment from Supplier.

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3. Packaging and Shipment:
 - a. Package and ship extra materials and special tools to avoid damage during long term storage in original cartons insofar as possible, or in appropriately sized, hinged-cover, wood, plastic, or metal box.
 - b. Prominently displayed on each package, the following:
 - 1) Manufacturer's part nomenclature and number, consistent with Operation and Maintenance Manual identification system.
 - 2) Applicable equipment description.
 - 3) Quantity of parts in package.
 - 4) Equipment manufacturer.
 4. Deliver materials to designated work sites.
 5. Project Director upon arrival for transfer of materials.
 6. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to Owner.
- D. Factory Test Results: Reviewed and accepted by Project Director before product shipment as required in individual Specification sections.

1.03 DELIVERY AND INSPECTION

- A. Deliver products in accordance with accepted current Progress Schedule and coordinate to avoid conflict with the Work and conditions at Site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.
- B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.
- C. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at Site. Promptly inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from Site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

1.04 HANDLING, STORAGE, AND PROTECTION

- A. Handle and store products in accordance with manufacturer's written instructions and in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01 50 00, Temporary Facilities and Controls. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.
- B. Manufacturer's instructions for material requiring special handling, storage, or protection shall be provided prior to delivery of material.
- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.
- D. Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures maintained above 60 degrees F. Protect electrical, instrumentation, and control products, and insulate against moisture, water, and dust damage. Connect and operate continuously space heaters furnished in electrical equipment.
- E. Store fabricated products above-ground on blocking or skids, and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- F. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.
- G. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.
- H. Hazardous Materials: Prevent contamination of personnel, storage area, and Site. Meet requirements of product specification, codes, and manufacturer's instructions.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual Specifications.
- B. Where product specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance specifications.
- C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- E. Provide interchangeable components of the same manufacturer, for similar components, unless otherwise specified.
- F. Equipment, Components, Systems, and Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, state, and local health and safety regulations.
- G. Regulatory Requirement: Coating materials shall meet federal, state, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
- H. Safety Guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, or galvanized or aluminum coated 1/2-inch mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.

- I. Authority Having Jurisdiction (AHJ):
 - 1. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.
 - 2. Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.

- J. Equipment Finish:
 - 1. Provide manufacturer's standard finish and color, except where specific color is indicated.
 - 2. If manufacturer has no standard color, provide equipment with gray finish as approved by Owner.

- K. Special Tools and Accessories: Furnish to Owner, upon acceptance of equipment, all accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, adequate oil and grease (as required for first lubrication of equipment after field testing), light bulbs, fuses, hydrant wrenches, valve keys, handwheels, chain operators, special tools, and other spare parts as required for maintenance.

- L. Lubricant: Provide initial lubricant recommended by equipment manufacturer in sufficient quantity to fill lubricant reservoirs and to replace consumption during testing, startup, and operation until final acceptance by Owner.

2.02 FABRICATION AND MANUFACTURE

- A. General:
 - 1. Manufacture parts to U.S.A. standard sizes and gauges.
 - 2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
 - 3. Design structural members for anticipated shock and vibratory loads.
 - 4. Use 1/4-inch minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
 - 5. Modify standard products as necessary to meet performance Specifications.

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B. Lubrication System:

1. Require no more than weekly attention during continuous operation.
2. Convenient and accessible; oil drains with bronze or stainless steel valves and fill-plugs easily accessible from the normal operating area or platform. Locate drains to allow convenient collection of oil during oil changes without removing equipment from its installed position.
3. Provide constant-level oilers or oil level indicators for oil lubrication systems.
4. For grease type bearings, which are not easily accessible, provide and install stainless steel tubing; protect and extend tubing to convenient location with suitable grease fitting.

2.03 SOURCE QUALITY CONTROL

- A. Where Specifications call for factory testing to be witnessed by Engineer, notify Engineer not less than 14 days prior to scheduled test date, unless otherwise specified.
- B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).
- C. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

PART 3 EXECUTION

3.01 INSPECTION

- A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove damaged material or equipment from the Site and expedite delivery of identical new material or equipment. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delays within Contractor's control.

3.02 INSTALLATION

- A. Equipment Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. No shimming between machined surfaces is allowed.

- C. Install the Work in accordance with NECA Standard of Installation, unless otherwise specified.
- D. Repaint painted surfaces that are damaged prior to equipment acceptance.
- E. Do not cut or notch any structural member or building surface without specific approval of Engineer.
- F. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers' instruction at Site, available for review at all times.
- G. For material and equipment specifically indicated or specified to be reused in the Work:
 - 1. Use special care in removal, handling, storage, and reinstallation to assure proper function in the completed Work.
 - 2. Arrange for transportation, storage, and handling of products that require offsite storage, restoration, or renovation. Include costs for such Work in the Contract Price.

3.03 FIELD FINISHING

- A. In accordance with Section 09 90 00, Painting, and individual Specification sections.

3.04 ADJUSTMENT AND CLEANING

- A. Perform required adjustments, tests, operation checks, and other startup activities.

3.05 LUBRICANTS

- A. Fill lubricant reservoirs and replace consumption during testing, startup, and operation prior to acceptance of equipment by Owner.

END OF SECTION

SECTION 01 64 00
OWNER-FURNISHED PRODUCTS

PART 1 GENERAL

1.01 DEFINITIONS

- A. Seller: The party under separate contract with Owner to furnish the products or special services specified herein.

1.02 OWNER-FURNISHED PRODUCTS

- A. 50kW standby diesel generator set.
- B. Automatic Transfer Switch.
- C. Vertical Turbine Pump and Motor Assembly.

1.03 INFORMATION FURNISHED BY OWNER

- A. Shop drawings related to Owner-furnished products will be made available for Contractor's use in performing the work under this section.
- B. Manufacturer's installation, operation, and maintenance instructions for Owner-furnished products will be made available.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings:
 - a. Show layout, location, and identification of materials provided by Contractor for installation of Owner-furnished products.
 - b. Provide electrical diagrams to indicate connecting and interconnecting electrical work.

1.05 TRANSFER OF PRODUCTS

- A. Unless indicated otherwise, items will be furnished f.o.b. the Project Site.
- B. Upon delivery, conduct with Owner or Engineer a joint inspection for the purpose of identifying product, general verification of quantities, and observation of apparent condition. Such inspection will not be construed as final or as receipt of any product that, as a result of subsequent inspections and tests, are determined to be nonconforming.

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- C. Damaged or incomplete products to be returned for replacement will not be unloaded, except as necessary to expedite return shipment. Owner will submit claims for transportation damage and expedite replacement of damaged, defective, or deficient items.
- D. Indicate signed acceptance of delivery on a copy of the invoice.
- E. If Contractor is not prepared to accept delivery of Owner-furnished products by either the specified Estimated Date of Arrival or such Owner-confirmed delivery date, as specified herein, associated costs incurred by Owner shall be borne by Contractor. Such costs may include, but not be limited to, demurrage, interest, insurance costs, additional administrative and engineering costs, additional factory and field technical support, additional storage and reshipping costs, cost escalation, and extended warranty costs due.

1.06 UNLOADING, STORAGE AND MAINTENANCE

- A. Subsequent to transfer, Contractor shall have complete responsibility for unloading Owner-furnished products. Unload product in accordance with manufacturers' instructions, or as specified.
- B. Store, protect, and maintain product to prevent damage until final acceptance of completed work. Damage to or loss of products after date of transfer to Contractor shall be repaired to original condition, or replaced with new identical products, at the discretion of Engineer.
- C. Maintain complete inventory of all Owner-furnished products after their transfer to Contractor.

1.07 SCHEDULING AND SEQUENCING

- A. Include sequencing constraints specified herein as part of Progress Schedule.
- B. Owner will keep Contractor informed of probable delivery date changes.
- C. Owner will confirm delivery date with Contractor 10 days prior to scheduled delivery, and within 24 hours of expected delivery time.

1.08 EXTRA MATERIALS

- A. Unless otherwise specified, Owner will take acceptance of, and be responsible for storing associated extra materials and special tools upon delivery.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install products in conformance with Owner-furnished product shop drawings and installation instructions.
- B. Provide all interconnecting equipment, piping, electrical work, finish painting, and appurtenances to achieve a complete and functional system.
- C. Provide foundation pads for Owner-furnished products as shown. Verify exact dimensions and configuration of all pads, including penetrations, with Owner-furnished product shop drawings.
- D. Anchor Bolts:
 - 1. Where required, provide anchor bolts, fasteners, washers, and templates needed for installation of Owner-furnished equipment.
 - 2. Size and locate anchor bolts in accordance with Owner-furnished product shop drawings and installation instructions.
- E. Mechanical and electrical equipment shall be properly aligned, plumb and level, with no stresses on connecting piping or conduit.
- F. Verify direction of motor rotation before starting equipment drives.
- G. Verify operability and safety of electrical system needed to operate equipment. Check electrical system for continuity, phasing, grounding, and proper functions.

3.02 PRODUCT PROTECTION

- A. Immediately after installation, lubricate components in accordance with manufacturer's instructions.
- B. Follow manufacturer's instructions for protection and maintenance during storage, after installation but prior to testing and startup, and after startup but prior to acceptance.
- C. Furnish incidental supplies including lubricants, cleaning fluids, and similar products as needed for protecting and maintaining the Owner-furnished products.

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3.03 TESTS AND INSPECTION

- A. Perform tests and inspections of installed products in accordance with requirements shown herein, Section 01 91 14, Equipment Testing and Facility Startup, and manufacturer's instructions.

END OF SECTION

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

PART 1 GENERAL

1.01 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.
 - a. Record Documents: As required in the Standard Agreement and specified in Section 01 38 00, As-Built Submittal Requirements.
 - b. Special bonds, Special Guarantees, and Service Agreements.
 - c. Request for Final Inspection.
 - d. Consent of Surety to Final Payment: As required in Paragraph 5.6 of the Standard Agreement.
 - e. Releases or Waivers of Liens and Claims: As required in Paragraph 5.6 of the Standard Agreement.
 - f. Releases from Agreements.
 - g. Final Application for Payment: Submit in accordance with procedures and requirements stated Paragraph 5.6 of the Standard Agreement and in Section 01 29 00, Payment Procedures.
 - h. Extra Materials: As required by individual Specification sections.

1.02 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Accuracy of Records:
 - a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
 - b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive Site measurement, investigation, and examination.
3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
4. Prior to submitting each request for progress payment, request Project Director's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may

result in a deferral by Project Director to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.03 RELEASES FROM AGREEMENTS

- A. Furnish Owner written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.
- B. In the event Contractor is unable to secure written releases:
 - 1. Inform Owner of the reasons.
 - 2. Owner or its representatives will examine the Site, and Owner will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
 - 3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory bond in a sum to cover legal Claims for damages.
 - 4. When Owner is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if: (i) Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate Claims that Contractor has failed to fulfill terms of side agreement or special easement, or (ii) Contractor is unable to contact or has had undue hardship in contacting grantor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
 - 1. Promptly following commencement of Contract Times, secure from Owner at no cost to Contractor, five complete sets of Contract Documents. Drawings will be full size.
 - 2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
 - 3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.

B. Preservation:

1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
2. Make documents and Samples available at all times for observation by Engineer.

C. Making Entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
 - a. Color Coding:
 - 1) Green when showing information deleted from Drawings.
 - 2) Red when showing information added to Drawings.
 - 3) Blue and circled in blue to show notes.
2. Date entries.
3. Call attention to entry by “cloud” drawn around area or areas affected.
4. Legibly mark to record actual changes made during construction, including, but not limited to:
 - a. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
 - b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
 - d. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
 - e. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, and Engineer’s written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
5. Dimensions on Schematic Layouts: Show on record drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
 - a. Clearly identify the item by accurate note such as “cast iron drain,” “galv. water,” and the like.
 - b. Show, by symbol or note, vertical location of item (“under slab,” “in ceiling plenum,” “exposed,” and the like).

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- c. Make identification so descriptive that it may be related reliably to Specifications.

3.02 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to Contractor's request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor's notice of completion, clean entire Site or parts thereof, as applicable.
 - 1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner.
 - 2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
 - 3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
 - 4. Rake clean all other surfaces.
 - 5. Leave water courses, gutters, and ditches open and clean.
- B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Detailed information for the preparation, submission, and Engineer's review of Operations and Maintenance (O&M) Data, as required by individual Specification sections.

1.02 DEFINITIONS

- A. Preliminary Data: Initial and subsequent submissions for Engineer's review.
- B. Final Data: Engineer-accepted data, submitted as specified herein.
- C. Maintenance Operation: As used on Maintenance Summary Form is defined to mean any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operations are lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.

1.03 SEQUENCING AND SCHEDULING

- A. Equipment and System Data:
 - 1. Preliminary Data:
 - a. Do not submit until Shop Drawing for equipment or system has been reviewed and approved by Engineer.
 - b. Submit prior to shipment date.
 - 2. Final Data: Submit Instructional Manual Formatted data not less than 30 days prior to equipment or system field functional testing. Submit Compilation Formatted and Electronic Media Formatted data prior to Substantial Completion of Project.

1.04 DATA FORMAT

- A. Prepare preliminary and final data in the form of an instructional manual. Prepare final data in data compilation format.
- B. Instructional Manual Format:
 - 1. Binder: Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.

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2. Size: 8-1/2 inches by 11 inches, minimum.
3. Cover: Identify manual with typed or printed title “OPERATION AND MAINTENANCE DATA” and list:
 - a. Project title.
 - b. Designate applicable system, equipment, material, or finish.
 - c. Identity of separate structure as applicable.
 - d. Identify volume number if more than one volume.
 - e. Identity of general subject matter covered in manual. Identity of equipment number and Specification section.
4. Spine:
 - a. Project title.
 - b. Identify volume number if more than one volume.
5. Title Page:
 - a. Contractor name, address, and telephone number.
 - b. Subcontractor, Supplier, installer, or maintenance contractor’s name, address, and telephone number, as appropriate.
 - 1) Identify area of responsibility of each.
 - 2) Provide name and telephone number of local source of supply for parts and replacement.
6. Table of Contents:
 - a. Neatly typewritten and arranged in systematic order with consecutive page numbers.
 - b. Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
7. Paper: 20-pound minimum, white for typed pages.
8. Text: Manufacturer’s printed data, or neatly typewritten.
9. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
10. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.

C. Data Compilation Format:

1. Compile all Engineer-accepted preliminary O&M data into a hard-copy, hard-bound set.
2. Each set shall consist of the following:
 - a. Binder: Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.
 - b. Cover: Identify each volume with typed or printed title “OPERATION AND MAINTENANCE DATA, VOLUME NO. ___ OF ___”, and list:
 - 1) Project title.
 - 2) Contractor’s name, address, and telephone number.

- 3) If entire volume covers equipment or system provided by one Supplier include the following:
 - a) Identity of general subject matter covered in manual.
 - b) Identity of equipment number and Specification section.
- c. Provide each volume with title page and typed table of contents with consecutive page numbers. Place contents of entire set, identified by volume number, in each binder.
- d. Table of contents neatly typewritten, arranged in a systematic order:
 - 1) Include list of each product, indexed to content of each volume.
 - 2) Designate system or equipment for which it is intended.
 - 3) Identify each product by product name and other identifying numbers or symbols as set forth in Contract Documents.
- e. Section Dividers:
 - 1) Heavy, 80 pound cover weight tabbed with numbered plastic index tabs.
 - 2) Fly-Leaf:
 - a) For each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment.
 - b) List with Each Product:
 - (1) Name, address, and telephone number of Subcontractor, Supplier, installer, and maintenance contractor, as appropriate.
 - (2) Identify area of responsibility of each.
 - (3) Provide local source of supply for parts and replacement.
 - c) Identity of separate structure as applicable.
- f. Assemble and bind material, as much as possible, in same order as specified in the Contract Documents.

1.05 SUBMITTALS

A. Informational:

1. Data Outline: Submit two copies of a detailed outline of proposed organization and contents of Final Data prior to preparation of Preliminary Data.
2. Preliminary Data:
 - a. Submit two copies for Engineer's review.
 - b. If data meets conditions of the Contract:
 - 1) One copy will be returned to Contractor.

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- 2) One copy will be forwarded to Project Director.
- 3) If data does not meet conditions of the Contract:
 - a) All copies will be returned to Contractor with Engineer's comments (on separate document) for revision.
 - b) Engineer's comments will be retained in Engineer's file.
 - c) Resubmit two copies revised in accordance with Engineer's comments.
3. Final Data: Submit three copies and one PDF file (CD or USB Drive) in format specified herein.

1.06 DATA FOR EQUIPMENT AND SYSTEMS

A. Content for Each Unit (or Common Units) and System:

1. Product Data:
 - a. Include only those sheets that are pertinent to specific product.
 - b. Clearly annotate each sheet to:
 - 1) Identify specific product or part installed.
 - 2) Identify data applicable to installation.
 - 3) Delete references to inapplicable information.
 - c. Function, normal operating characteristics, and limiting conditions.
 - d. Performance curves, engineering data, nameplate data, and tests.
 - e. Complete nomenclature and commercial number of replaceable parts.
 - f. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
 - g. Spare parts ordering instructions.
 - h. Where applicable, identify installed spares and other provisions for future work (e.g., reserved panel space, unused components, wiring, terminals).
2. As-installed, color-coded piping diagrams.
3. Charts of valve tag numbers, with the location and function of each valve.
4. Drawings: Supplement product data with Drawings as necessary to clearly illustrate:
 - a. Format:
 - 1) Provide reinforced, punched, binder tab; bind in with text.
 - 2) Reduced to 8-1/2 inches by 11 inches, or 11 inches by 17 inches folded to 8-1/2 inches by 11 inches.

- 3) Where reduction is impractical, fold and place in 8-1/2-inch by 11-inch envelopes bound in text.
 - 4) Identify Specification section and product on Drawings and envelopes.
 - b. Relations of component parts of equipment and systems.
 - c. Control and flow diagrams.
 - d. Coordinate drawings with Project record documents to assure correct illustration of completed installation.
 5. Instructions and Procedures: Within text, as required to supplement product data.
 - a. Format:
 - 1) Organize in consistent format under separate heading for each different procedure.
 - 2) Provide logical sequence of instructions for each procedure.
 - 3) Provide information sheet for Owner's personnel, including:
 - a) Proper procedures in event of failure.
 - b) Instances that might affect validity of guarantee or Bond.
 - b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
 - c. Operating Procedures:
 - 1) Startup, break-in, routine, and normal operating instructions.
 - 2) Test procedures and results of factory tests where required.
 - 3) Regulation, control, stopping, and emergency instructions.
 - 4) Description of operation sequence by control manufacturer.
 - 5) Shutdown instructions for both short and extended duration.
 - 6) Summer and winter operating instructions, as applicable.
 - 7) Safety precautions.
 - 8) Special operating instructions.
 - d. Maintenance and Overhaul Procedures:
 - 1) Routine maintenance.
 - 2) Guide to troubleshooting.
 - 3) Disassembly, removal, repair, reinstallation, and re-assembly.
 6. Guarantee, Bond, and Service Agreement: In accordance with Section 01 77 00, Closeout Procedures.
- B. Content for Each Electric or Electronic Item or System:
1. Description of Unit and Component Parts:
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, nameplate data, and tests.

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- c. Complete nomenclature and commercial number of replaceable parts.
 - d. Interconnection wiring diagrams, including control and lighting systems.
 2. Circuit Directories of Panelboards:
 3. Electrical service.
 4. Control requirements and interfaces.
 5. Communication requirements and interfaces.
 6. List of electrical relay settings, and control and alarm contact settings.
 7. Electrical interconnection wiring diagram, including as applicable, single-line, three-line, schematic and internal wiring, and external interconnection wiring.
 8. As-installed control diagrams by control manufacturer.
 9. Operating Procedures:
 - a. Routine and normal operating instructions.
 - b. Startup and shutdown sequences, normal and emergency.
 - c. Safety precautions.
 - d. Special operating instructions.
 10. Maintenance Procedures:
 - a. Routine maintenance.
 - b. Guide to troubleshooting.
 - c. Adjustment and checking.
 - d. List of relay settings, control and alarm contact settings.
 11. Manufacturer's printed operating and maintenance instructions.
 12. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- C. Maintenance Summary:
 1. Compile individual Maintenance Summary for each applicable equipment item, respective unit or system, and for components or sub-units.
 2. Format:
 - a. Use Maintenance Summary Form bound with this section or electronic facsimile of such.
 - b. Each Maintenance Summary may take as many pages as required.
 - c. Use only 8-1/2-inch by 11-inch size paper.
 - d. Complete using typewriter or electronic printing.
 3. Include detailed lubrication instructions and diagrams showing points to be greased or oiled; recommend type, grade, and temperature range of lubricants and frequency of lubrication.
 4. Recommended Spare Parts:
 - a. Data to be consistent with manufacturer's Bill of Materials/Parts List furnished in O&M manuals.

- b. “Unit” is the unit of measure for ordering the part.
- c. “Quantity” is the number of units recommended.
- d. “Unit Cost” is the current purchase price.

1.07 DATA FOR MATERIALS AND FINISHES

A. Content for Architectural Products, Applied Materials, and Finishes:

- 1. Manufacturer’s data, giving full information on products:
 - a. Catalog number, size, and composition.
 - b. Color and texture designations.
 - c. Information required for reordering special-manufactured products.
- 2. Instructions for Care and Maintenance:
 - a. Manufacturer’s recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods that are detrimental to product.
 - c. Recommended schedule for cleaning and maintenance.

B. Content for Moisture Protection and Weather Exposed Products:

- 1. Manufacturer’s data, giving full information on products:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
- 2. Instructions for inspection, maintenance, and repair.

1.08 SUPPLEMENTS

A. The supplement listed below, following “End of Section”, is part of this Specification.

- 1. Forms: Maintenance Summary Form.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

MAINTENANCE SUMMARY FORM

PROJECT: _____ CONTRACT NO.: _____

- 1. EQUIPMENT ITEM _____
- 2. MANUFACTURER _____
- 3. EQUIPMENT/TAG NUMBER(S) _____
- 4. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS) _____
- 5. NAMEPLATE DATA (hp, voltage, speed, etc.) _____
- 6. MANUFACTURER’S LOCAL REPRESENTATIVE _____
 - a. Name _____ Telephone No. _____
 - b. Address _____

7. MAINTENANCE REQUIREMENTS

Maintenance Operation Comments	Frequency	Lubricant (If Applicable)
List briefly each maintenance operation required and refer to specific information in manufacturer’s standard maintenance manual, if applicable. (Reference to manufacturer’s catalog or sales literature is not acceptable.)	List required frequency of each maintenance operation.	Refer by symbol to lubricant required.

SECTION 01 88 15
ANCHORAGE AND BRACING

PART 1 GENERAL

1.01 SUMMARY

- A. This section covers requirements for anchorage and bracing of equipment, distribution systems, and other nonstructural components required in accordance with the Florida Building Code Seventh Edition (2020), for wind, gravity, soil, and operational loads.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads for Buildings and Other Structures.
 2. International Code Council (ICC): International Building Code (IBC).
 3. Florida Building Code Seventh Edition (2020).
- B. Design criteria listed on Sheet General Structural Notes on Drawings.

1.03 DEFINITIONS

- A. Authority Having Jurisdiction (AHJ): Permitting building agency; may be a federal, state, local, or other regional department, or individual including building official, fire chief, fire marshal, chief of a fire prevention bureau, labor department, or health department, electrical inspector; or others having statutory authority. AHJ may be Owner when authorized to be self-permitting by governmental permitting agency or when no governmental agency has authority.

1.04 DESIGN AND PERFORMANCE REQUIREMENTS

- A. General:
1. Anchorage and bracing systems shall be designed by a qualified professional engineer registered in the State of Florida.
 2. Design anchorage and bracing of mechanical, and electrical components and systems in accordance with this section, unless a design is specifically provided within Contract Documents or where exempted hereinafter.

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3. Design attachments, braces, and anchors for equipment, components, and distribution systems to structure for gravity, wind, and operational loading.
4. Anchor and brace piping whether exempt or not exempt for this section, so that lateral or vertical displacement does not result in damage or failure to essential mechanical, or electrical equipment.
5. Provide supplementary framing where required to transfer anchorage and bracing loads to structure.
6. Adjust equipment pad sizes or provide additional anchorage confinement reinforcing to provide required anchorage capacities.

B. Design Loads:

1. Gravity: Design anchorage and bracing for self weight and superimposed loads on components and equipment.
2. Wind: Design anchorage and bracing for wind criteria provided on General Structural Notes on Drawings for wind-exposed mechanical and electrical equipment.
3. Operational:
 - a. For loading supplied by equipment manufacturer for FBC required load cases.
 - b. Loads may include equipment vibration, torque, thermal effects, effects of internal contents (weight and sloshing), water hammer, and other load-inducing conditions.
 - c. Locate braces to minimize vibration to or movement of structure.
 - d. For vibrating loads, use anchors meeting requirements of Section 05 50 00, Metal Fabrications or Section 05 05 19, Post-Installed Anchors, for anchors with designated capacities for vibratory loading per manufacturer's ICC-ES report.

1.05 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
 - a. List of mechanical, and electrical equipment requiring Contractor-designed anchorage and bracing, unless specifically exempted.
 - b. Attachment assemblies' drawings; include connection hardware, braces, and anchors or anchor bolts for nonexempt components, equipment, and systems.
 - c. Submittal will be rejected if proposed anchorage method would create excessive stress to supporting member. Revise anchorages and strengthen structural support to eliminate overstressed condition.

B. Informational Submittals:

1. Anchorage and Bracing Calculations: For attachments, braces, and anchorages, include FBC and Project-specific criteria as noted on General Structural Notes on Drawings, in addition to manufacturer's specific criteria used for design; sealed by an engineer registered in the State of Florida.
2. Manufacturer's hardware installation requirements.

1.06 SOURCE QUALITY CONTROL

- A. Provide all other specified, regulatory required, or required repair verification inspection and testing in accordance with Section 01 45 16.13, Contractor Quality Control.
- B. Provide Source Quality Control for welding and hot-dip galvanizing of anchors in accordance with Section 05 50 00, Metal Fabrications.

PART 2 PRODUCTS

2.01 GENERAL

- A. Design and construct attachments and supports transferring loads to structure of materials and products suitable for application and in accordance with design criteria shown on Drawings and nationally recognized standards.
- B. Provide anchor bolts for anchorage of equipment to concrete or masonry in accordance with Section 05 50 00, Metal Fabrications. Provide anchor bolts of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by Engineer.
- C. Provide post-installed concrete and masonry anchors for anchorage of equipment to concrete or masonry in accordance with Section 05 05 19, Post-Installed Anchors. Provide post-installed anchors of the size, minimum embedment, and spacing designated in calculations submitted by Contractor and accepted by Engineer.
- D. Do not use powder-actuated fasteners or sleeve anchors where resistance to tension loads is required. Do not use expansion anchors, other than undercut anchors, for nonvibration isolated mechanical equipment rated over 10 horsepower.

PART 3 EXECUTION

3.01 GENERAL

- A. Make attachments, bracing, and anchorage in such a manner that component lateral force is transferred to lateral force resisting system of structure through a complete load path.
- B. Provide snubbers in each horizontal direction and vertical restraints for components mounted on vibration isolation systems where required to resist overturning.
- C. Provide piping anchorage that maintains design flexibility and expansion capabilities at flexible connections and expansion joints.

3.02 INSTALLATION

- A. Do not install components or their anchorages or restraints prior to review and acceptance by Engineer and AHJ.

3.03 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

- A. In accordance with Section 05 50 00, Metal Fabrications, and Section 05 05 19, Post-Installed Anchors.
- B. Provide any other specified, regulatory required, or required repair verification inspection and testing in accordance with Section 01 45 16.13, Contractor Quality Control.

END OF SECTION

SECTION 01 91 14
EQUIPMENT TESTING AND FACILITY STARTUP

PART 1 GENERAL

1.01 DEFINITIONS

- A. Facility: Well pumps/motors, wellhead piping, control systems and associated appurtenances or an agreed-upon portion, including all of its unit processes.
- B. Functional Test: Test or tests in presence of Engineer and Project Director to demonstrate that installed equipment meets manufacturer's installation, calibration, and adjustment requirements and other requirements as specified.
- C. Performance Test: Test or tests performed after any required functional test in presence of Engineer and Project Director to demonstrate and confirm individual equipment meets performance requirements specified in individual sections.
- D. Facility Performance Demonstration:
 - 1. A demonstration, conducted by Contractor, with assistance of Owner, to demonstrate and document the performance of the entire operating facility, both manually and automatically (if required), based on criteria developed in conjunction with Owner and as accepted by the Project Director.
 - 2. Such demonstration is for the purposes of (i) verifying to Owner entire facility performs as a whole, and (ii) documenting performance characteristics of completed facility for Owner's records. Neither the demonstration nor the evaluation is intended in any way to make performance of the entire facility the responsibility of Contractor, unless such performance is otherwise specified.

1.02 SUBMITTALS

- A. Informational Submittals:
 - 1. Facility Startup and Performance Demonstration Plan.
 - 2. Functional and performance test results.
 - 3. Completed Facility Performance Demonstration/Certification Form.

1.03 FACILITY STARTUP AND PERFORMANCE DEMONSTRATION PLAN

- A. Develop a written plan, in conjunction with Owner's operations personnel; to include the following:
1. Step-by-step instructions for startup of wellhead following completion of work. Instruction shall also cover startup and coordination efforts with well pump and motor installation contractor who will participate in startup and testing activities.
 2. Wellhead Startup Form (sample attached), to minimally include the following:
 - a. Description of the equipment numbers/nomenclature of each item of equipment and all included devices involved in the startup.
 - b. Detailed procedure for startup including pumps to be operated, valves to be opened/closed, order of equipment startup, etc.
 - c. Space for evaluation comments.
 3. Facility Performance Demonstration/Certification Form (sample attached), to minimally include the following:
 - a. Description of the facility.
 - b. Sequence of activities to achieve startup.
 - c. Description of computerized operations, if any, included in the facility.
 - d. Contractor certification facility is capable of performing its intended function(s), including fully automatic operation.
 - e. Signature spaces for Contractor and Project Director.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Facility Startup Meetings: Schedule, in accordance with requirements of Section 01 31 19, Project Meetings, to discuss test schedule, test methods, materials, chemicals and liquids required, facilities operations interface, and Owner involvement.
- B. Contractor's Testing and Startup Representative:
1. Designate and furnish one or more personnel to coordinate and expedite testing and facility startup.
 2. Representative(s) shall be present during startup meetings and shall be available at all times during testing and startup.

- C. Provide temporary valves, gauges, piping, test equipment and other materials and equipment required for testing and startup.
- D. Provide Subcontractor and equipment manufacturers' staff adequate to prevent delays. Schedule ongoing work so as not to interfere with or delay testing and startup.
- E. Owner will: Provide power, and other items as required for startup, unless otherwise indicated.

3.02 EQUIPMENT TESTING

- A. Preparation:
 - 1. Complete installation before testing.
 - 2. Furnish qualified manufacturers' representatives, when required by individual Specification sections.
 - 3. Obtain and submit from equipment manufacturer's representative Manufacturer's Certificate of Proper Installation Form, in accordance with Section 01 43 33, Manufacturers' Field Services, when required by individual Specification sections.
 - 4. Equipment Test Report Form: Provide written test report for each item of equipment to be tested, to include the minimum information:
 - a. Owner/Project Name.
 - b. Equipment or item tested.
 - c. Date and time of test.
 - d. Type of test performed (Functional or Performance).
 - e. Test method.
 - f. Test conditions.
 - g. Test results.
 - h. Signature spaces for Contractor and Project Director as witness.
 - 5. Cleaning and Checking: Prior to beginning functional testing:
 - a. Calibrate testing equipment in accordance with manufacturer's instructions.
 - b. Inspect and clean equipment, devices, connected piping, and structures to ensure they are free of foreign material.
 - c. Lubricate equipment in accordance with manufacturer's instructions.
 - d. Turn rotating equipment by hand when possible to confirm that equipment is not bound.
 - e. Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.

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- f. Check power supply to electric-powered equipment for correct voltage.
 - g. Adjust clearances and torque.
 - h. Test piping for leaks.
6. Ready-to-test determination will be by Project Director based at least on the following:
- a. Acceptable Operation and Maintenance Data.
 - b. Notification by Contractor of equipment readiness for testing.
 - c. Receipt of Manufacturer's Certificate of Proper Installation, if so specified.
 - d. Adequate completion of work adjacent to, or interfacing with, equipment to be tested.
 - e. Availability and acceptability of manufacturer's representative, when specified, to assist in testing of respective equipment.
 - f. Satisfactory fulfillment of other specified manufacturer's responsibilities.
 - g. Equipment and electrical tagging complete.
 - h. Delivery of all spare parts and special tools.

B. Functional Testing:

- 1. Conduct as specified in individual Specification sections.
- 2. Notify Project Director in writing at least 10 days prior to scheduled date of testing.
- 3. Prepare Equipment Test Report summarizing test method and results.
- 4. When, in Project Director's opinion, equipment meets functional requirements specified, such equipment will be accepted for purposes of advancing to performance testing phase, if so required by individual Specification sections. Such acceptance will be evidenced by Project Director's signature as witness on Equipment Test Report.

C. Performance Testing:

- 1. Conduct as specified in individual Specification sections.
- 2. Notify Project Director in writing at least 10 days prior to scheduled date of test.
- 3. Performance testing shall not commence until equipment has been accepted by Project Director as having satisfied functional test requirements specified.
- 4. Type of fluid, gas, or solid for testing shall be as specified.

5. Unless otherwise indicated, furnish labor, materials, and supplies for conducting the test and taking samples and performance measurements.
6. Prepare Equipment Test Report summarizing test method and results.
7. When, in Project Director's opinion, equipment meets performance requirements specified, such equipment will be accepted as to conforming to Contract requirements. Such acceptance will be evidenced by Project Director's signature on Equipment Test Report.

3.03 SUPPLEMENTS

- A. Supplement listed below, following "End of Section," is a part of this Specification:
 1. Startup Form.

END OF SECTION

STARTUP FORM

OWNER: _____ **PROJECT:** _____

Description: (Include description and equipment number of all equipment and devices):

Startup Procedure (Describe procedure for sequential startup and evaluation, including valves to be opened/closed, order of equipment startup, etc.):

Startup Requirements (Water, power, chemicals, etc.): _____

Evaluation Comments: _____

Contractor Certification that Facility is capable of performing its intended function(s), including fully automatic operation:

Contractor: _____ **Date:** _____, 20__

Engineer: _____ **Date:** _____, 20__

(Authorized Signature)

SECTION 05 05 19
POST-INSTALLED ANCHORS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Concrete Institute (ACI):
 - a. 318, Building Code Requirements for Structural Concrete.
 - b. 355.2, Qualification of Post-Installed Mechanical Anchors in Concrete.
 - c. 355.4, Qualification of Post-Installed Adhesive Anchors in Concrete.
 2. American Iron and Steel Institute (AISI): Stainless Steel Type 316.
 3. American National Standards Institute (ANSI).
 4. ASTM International (ASTM):
 - a. A193/A193M, Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - b. A194/A194M, Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.
 - c. A380, Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
 - d. A563, Specification for Carbon and Alloy Steel Nuts.
 - e. A967, Specification for Chemical Passivation Treatments for Stainless Steel Parts.
 - f. E488, Standard Test Methods for Strength of Anchors in Concrete Elements.
 - g. F436, Specification for Hardened Steel Washers.
 - h. F468, Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use.
 - i. F568M, Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners.
 - j. F593, Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - k. F594, Specification for Stainless Steel Nuts.
 - l. F1554, Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

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5. International Association of Plumbing and Mechanical Officials Uniform ES (IAPMO-UES): Evaluation Reports for Concrete and Masonry Anchors.
6. International Code Council Evaluation Service (ICC-ES):
 - a. Evaluation Reports for Concrete and Masonry Anchors.
 - b. AC70, Acceptance Criteria for Fasteners Power-driven into Concrete, Steel and Masonry Elements.
 - c. AC193, Acceptance Criteria for Mechanical Anchors in Concrete Elements.
 - d. AC308, Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements. Evaluation Reports for Concrete and Masonry Anchors.
7. Specialty Steel Industry of North America (SSINA):
 - a. Specifications for Stainless Steel.
 - b. Design Guidelines for the Selection and Use of Stainless Steel.
 - c. Stainless Steel Fabrication.
 - d. Stainless Steel Fasteners.

1.02 SUBMITTALS

A. Action Submittals:

1. Shop Drawings: Specific instructions for concrete anchor installation, including drilled hole size and depth, preparation, placement, procedures, and instructions for safe handling of anchoring systems.

B. Informational Submittals:

1. Concrete Anchors:
 - a. Manufacturer's product description and installation instructions.
 - b. Current ICC-ES or IAPMO-UES Report for each type of post-installed anchor to be used.
2. Passivation method for stainless steel members.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Package stainless steel items in a manner to provide protection from carbon impregnation.

PART 2 PRODUCTS

2.01 GENERAL

A. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
Stainless Steel:	
Threaded Rods	F593, AISI Type 316, Condition CW
Nuts*	F594, AISI Type 316, Condition CW
*Nuts of other grades and styles having specified proof load stresses greater than specified grade and style are also suitable. Nuts must have specified proof load stresses equal to or greater than minimum tensile strength of specified threaded rod.	

B. Bolts, Washers, and Nuts: Use stainless steel material types as indicated in Fastener Schedule at end of this section.

2.02 POST-INSTALLED CONCRETE ANCHORS

A. General:

1. AISI Type 316 stainless as shown in Fastener Schedule at end of this section.
2. Post-installed anchor systems used in concrete shall be approved by ICC Evaluation Services Report or equivalent for use in cracked concrete and for short-term and long-term loads including wind and earthquake.
3. Mechanical Anchors: Comply with the requirements of ICC-ES AC193 or ACI 355.2.
4. Adhesive Anchors: Comply with the requirements of ICC-ES AC308 or ACI 355.4.

B. Torque-Controlled Expansion Anchors (Wedge Anchors):

1. Manufacturers and Products:
 - a. Hilti, Inc., Tulsa, OK; Kwik-Bolt –TZ (KB-TZ) Anchors (ESR-1917).
 - b. DeWalt/Powers Fasteners, Brewster, NY; Power-Stud +SD1 , +SD2, +SD4, or +SD6 Anchors (ESR-2502 and ESR-2818).
 - c. Simpson Strong-Tie Co., Inc., Pleasanton, CA; Strong-Bolt 2 Anchors (ESR-1771 and ESR-3037).

C. Self-Tapping Concrete Screw Anchors:

1. Manufacturers and Products:
 - a. DeWalt/Powers Fasteners, Brewster, NY; Wedge-Bolt+ (ESR-2526).
 - b. DeWalt/Powers Fasteners, Brewster, NY; Vertigo+ Rod Hanger Screw Anchor (ESR-2989).
 - c. DeWalt/Powers Fasteners, Brewster, NY; Snake+ Flush Mount Screw Anchor (ESR-2272).
 - d. Hilti, Inc., Tulsa, OK; HUS-EZ Screw Anchor (ESR-3027).
 - e. Simpson Strong-Tie Co., Inc., Pleasanton, CA; Titen HD Screw Anchor (ESR-2713).

D. Adhesive Anchors:

1. Threaded Rod:
 - a. Diameter as shown on Drawings.
 - b. Length as required to provide minimum depth of embedment indicated and thread projection required.
 - c. Clean and free of grease, oil, or other deleterious material.
2. Adhesive:
 - a. Two-component, insensitive to moisture, designed to be used in adverse freeze/thaw environments.
 - b. Cure Temperature, Pot Life, and Workability: Compatible for intended use and anticipated environmental conditions.
3. Packaging and Storage:
 - a. Disposable, self-contained system capable of dispensing both components in proper mixing ratio and fitting into a manually or pneumatically operated caulking gun.
 - b. Store adhesive on pallets or shelving in a covered storage area.
 - c. Package Markings: Include manufacturer's name, product name, batch number, product expiration date, ANSI hazard classification, and appropriate ANSI handling precautions.
 - d. Dispose of When:
 - 1) Shelf life has expired.
 - 2) Stored other than in accordance with manufacturer's instructions.
4. Manufacturers and Products:
 - a. Hilti, Inc., Tulsa, OK; HIT Doweling Anchor System, HIT RE 500 V3 (ESR-3814), or HIT-HY 200 (ESR-3187).
 - b. Simpson Strong-Tie Co., Inc., Pleasanton, CA; SET-XP Epoxy Adhesive Anchors (ESR-2508), or AT-XP Adhesive Anchors (IAPMO UES-263).
 - c. DeWalt/Powers Fasteners, Brewster NY; Pure 110+ Epoxy adhesive anchor system (ESR-3298).

E. Adhesive Threaded Inserts:

1. Type 316 stainless steel, internally threaded inserts.
2. Manufacturer and Product: Hilti, Inc., Tulsa, OK; HIS-RN Insert with HIT RE 500-V3 or HIT-HY 200 adhesive.

PART 3 EXECUTION

3.01 CONCRETE ANCHORS

- A. Begin installation only after concrete to receive anchors has attained design strength.
- B. Locate existing reinforcing with Ground Penetrating Radar or other method approved by Engineer prior to drilling. Coordinate with Engineer to adjust anchor locations where installation would result in hitting reinforcing.
- C. Install in accordance with written manufacturer's instructions.
- D. Provide minimum embedment, edge distance, and spacing as follows:

Anchor Type	Minimum Embedment (Bolt Diameters)	Minimum Edge Distance (Bolt Diameters)	Minimum Spacing (Bolt Diameters)
Expansion	6	6	12
Undercut	6	12	16
Adhesive	6	9	13.5

- E. Use only drill type and bit type and diameter recommended by anchor manufacturer.
- F. Clean hole of debris and dust per manufacturer's requirements.
- G. When unidentified embedded steel, rebar, or other obstruction is encountered in drill path, slant drill to clear obstruction. If drill must be slanted more than indicated in manufacturer's installation instructions to clear obstruction, notify Engineer for direction on how to proceed.
- H. Adhesive Anchors:
 1. Unless otherwise approved by Engineer and adhesive manufacturer:
 - a. Do not install adhesive anchors when temperature of concrete is below 40 degrees F or above 100 degrees F.

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- b. Do not install prior to concrete attaining an age of 21 days.
- c. Remove any standing water from hole with oil-free compressed air. Inside surface of hole shall be dry.
- d. Do not disturb anchor during recommended curing time.
- e. Do not exceed maximum torque as specified in manufacturer's instructions.

3.02 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

- A. Contractor-Furnished Quality Control: Inspection and testing as required in Section 01 45 16.13, Contractor Quality Control.

3.03 FASTENER SCHEDULE

- A. Unless indicated otherwise on Drawings, provide fasteners as follows:

Service Use and Location	Product	Remarks
All areas	Stainless steel anchors, adhesive anchors and fasteners	Verify product acceptability and manufacturer's requirements if anchor installation will occur in an overhead application

- B. Antiseizing Lubricant: Use on all stainless steel threads.
- C. Do not use adhesive anchors to support fire-resistive construction or where ambient temperature will exceed 120 degrees F.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. The Aluminum Association, Inc. (AA): The Aluminum Design Manual.
 2. American Galvanizers Association (AGA):
 - a. Inspection of Hot-Dip Galvanized Steel Products.
 - b. Quality Assurance Manual.
 3. American Iron and Steel Institute (AISI): Stainless Steel Types.
 4. American National Standards Institute (ANSI).
 5. American Welding Society (AWS):
 - a. D1.1/D1.1M, Structural Welding Code - Steel.
 - b. D1.2/D1.2M, Structural Welding Code - Aluminum.
 - c. D1.6/D1.6M, Structural Welding Code - Stainless Steel.
 6. ASTM International (ASTM):
 - a. A36/A36M, Standard Specification for Carbon Structural Steel.
 - b. A48/A48M, Specification for Gray Iron Castings.
 - c. A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - d. A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
 - e. A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - f. A143/A143M, Standard for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - g. A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - h. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - i. A194/A194M, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
 - j. A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - k. A276, Standard Specification for Stainless Steel Bars and Shapes.

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- l. A283/A283M, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- m. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- n. A325, Standard Specification for Structural Bolts, Steel, Heat Treated 120/105 ksi Minimum Tensile Strength.
- o. A380, Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems.
- p. A384/A384M, Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.
- q. A385/A385M, Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
- r. A489, Standard Specification for Carbon Steel Lifting Eyes.
- s. A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- t. A563, Standard Specification for Carbon and Alloy Steel Nuts.
- u. A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- v. A780/A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- w. A786/A786M, Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
- x. A793, Standard Specification for Rolled Floor Plate, Stainless Steel.
- y. A967, Standard Specification for Chemical Passivation Treatments for Stainless Steel Parts.
- z. A992/A992M, Standard Specification for Structural Steel Shapes.
- aa. A1085, Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS).
- bb. B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- cc. B308/B308M, Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
- dd. B429/B429M, Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
- ee. B632/B632M, Standard Specification for Aluminum-Alloy Rolled Tread Plate.
- ff. C881/C881M, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- gg. D1056, Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

- hh. F436, Standard Specification for Hardened Steel Washers.
 - ii. F468, Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use.
 - jj. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - kk. F594, Standard Specification for Stainless Steel Nuts.
 - ll. F844, Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.
 - mm. F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
7. Specialty Steel Industry of North America (SSINA):
- a. Specifications for Stainless Steel.
 - b. Design Guidelines for the Selection and Use of Stainless Steel.
 - c. Stainless Steel Fabrication.
 - d. Stainless Steel Fasteners.

1.02 DEFINITIONS

- A. Anchor Bolt: Cast-in-place anchor in concrete.
- B. Exterior Area: Location not protected from weather by building or other enclosed structure.

1.03 SUBMITTALS

- A. Action Submittals:
 - 1. Shop Drawings: Metal fabrications, including welding and fastener information.
- B. Informational Submittals:
 - 1. Passivation method for stainless steel members.
 - 2. Hot-Dip Galvanizing: Certificate of compliance signed by galvanizer, with description of material processed and ASTM standard used for coating.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Galvanized Coating Applicator: Company specializing in hot-dip galvanizing after fabrication and following procedures of Quality Assurance Manual of the American Galvanizers Association.

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1.05 DELIVERY, STORAGE, AND HANDLING

- A. Insofar as practical, factory assemble specified items. Package assemblies, which have to be shipped unassembled to protect materials from damage and tag to facilitate identification and field assembly.
- B. Package stainless steel items to provide protection from carbon impregnation.
- C. Protect painted coatings and hot-dip galvanized finishes from damage as a result of metal banding and rough handling. Use padded slings and straps.
- D. Store fabricated items in dry area, not in direct contact with ground.

PART 2 PRODUCTS

2.01 GENERAL

- A. Unless otherwise indicated, meet the following requirements:

Item	ASTM Reference
Steel Wide Flange Shapes	A992/992M
Other Steel Shapes and Plates	A36/A36M or A572/A572M, Grade 50 or A992/A992M for other steel shapes
Hollow Structural Sections (HSS)	A1085
Aluminum:	
Aluminum Plates	B209, Alloy 6061-T6
Aluminum Structural Shapes	B308/B308M, Alloy 6061-T6
Stainless Steel:	
Bars and Angles	A276, AISI Type 316 (316L for welded connections)
Shapes	A276, AISI Type 304 (304L for welded connections)
Steel Plate, Sheet, and Strip	A240/A240M, AISI Type 316 (316L for welded connections)
Bolts, Threaded Rods, Anchor Bolts, and Anchor Studs	F593, AISI Type 316, Group 2, Condition SH
Nuts	F594, AISI Type 316, Condition CW

Item	ASTM Reference
Steel Bolts and Nuts:	
Carbon Steel	A307 bolts, with A563 nuts
High-Strength	F3125, Type 1 bolts, with A563 nuts
Anchor Bolts and Rods	F1554, Grade 36, with weldability supplement S1.
Eyebolts	A489
Threaded Rods	A36/A36M
Flat Washers (Unhardened)	F844
Flat and Beveled Washers (Hardened)	F436
Thrust Ties for Steel Pipe:	
Threaded Rods	A193/A193M, Grade B7
Nuts	A194/A194M, Grade 2H
Plate	A283/A283M, Grade D
Welded Anchor Studs	A108, Grades C-1010 through C-1020
Aluminum Bolts and Nuts	F468, Alloy 2024-T4
Cast Iron	A48/A48M, Class 35

- B. Bolts, Washers, and Nuts: Use stainless steel, hot-dip galvanized steel, zinc-plated steel, and aluminum material types as indicated in Fastener Schedule at end of this section.

2.02 ANCHOR BOLTS AND ANCHOR BOLT SLEEVES

- A. Cast-In-Place Anchor Bolts:
1. Headed type, unless otherwise shown on Drawings.
 2. Material type and protective coating as shown in Fastener Schedule at end of this section.

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B. Anchor Bolt Sleeves:

1. Plastic:
 - a. Single unit construction with corrugated sleeve.
 - b. Top of sleeve shall be self-threading to provide adjustment of threaded anchor bolt projection.
 - c. Material: High-density polyethylene.
2. Fabricated Steel: ASTM A36/A36M.

2.03 POST-INSTALLED CONCRETE ANCHORS

- A. See Section 05 05 19, Post-Installed Anchors.

2.04 ACCESSORIES

A. Antiseizing Lubricant for Stainless Steel Threaded Connections:

1. Suitable for potable water supply.
2. Resists washout.
3. Manufacturers and Products:
 - a. Bostik, Middleton, MA; Neverseez.
 - b. Saf-T-Eze Div., STL Corp., Lombard, IL; Anti-Seize.

B. Neoprene Gasket:

1. ASTM D1056, 2C1, soft, closed-cell neoprene gasket material, suitable for exposure to sewage and sewage gases, unless otherwise shown on Drawings.
2. Thickness: Minimum 1/4 inch.
3. Furnish without skin coat.
4. Manufacturer and Product: Monmouth Rubber and Plastics Corporation, Long Branch, NJ; Durafoam DK1111LD.

2.05 FABRICATION

A. General:

1. Finish exposed surfaces smooth, sharp, and to well-defined lines.
2. Furnish necessary rabbets, lugs, and brackets so work can be assembled in neat, substantial manner.
3. Conceal fastenings where practical; where exposed, flush countersink.
4. Drill metalwork and countersink holes as required for attaching hardware or other materials.

5. Grind cut edges smooth and straight. Round sharp edges to small uniform radius. Grind burrs, jagged edges, and surface defects smooth.
6. Fit and assemble in largest practical sections for delivery to Site.

B. Materials:

1. Use steel shapes, unless otherwise noted.
2. Steel to be hot-dip galvanized: Limit silicon content to less than 0.04 percent or to between 0.15 percent and 0.25 percent.
3. Fabricate aluminum in accordance with AA Specifications for Aluminum Structures—Allowable Stress Design.

C. Welding:

1. Weld connections and grind exposed welds smooth. When required to be watertight, make welds continuous.
2. Welded fabrications shall be free from twisting or distortion caused by improper welding techniques.
3. Steel: Meet fabrication requirements of AWS D1.1/D1.1M, Section 5.
4. Aluminum: Meet requirements of AWS D1.2/D1.2M.
5. Stainless Steel: Meet requirements of AWS D1.6/D1.6M.
6. Complete welding before applying finish.

D. Painting:

1. Shop prime with rust-inhibitive primer as specified in Section 09 90 00, Painting, unless otherwise indicated.
2. Coat surfaces of galvanized steel and aluminum fabricated items to be in direct contact with concrete, grout, masonry, or dissimilar metals, as specified in Section 09 90 00, Painting, unless indicated otherwise.
3. Do not apply protective coating to galvanized steel anchor bolts or galvanized steel welded anchor studs, unless indicated otherwise.

E. Galvanizing:

1. Fabricate steel to be galvanized in accordance with ASTM A143/A143M, ASTM A384/A384M, and ASTM A385/A385M. Avoid fabrication techniques that could cause distortion or embrittlement of the steel.
2. Provide venting and drain holes for tubular members and fabricated assemblies in accordance with ASTM A385/A385M.
3. Remove welding slag, splatter, burrs, grease, oil, paint, lacquer, and other deleterious material prior to delivery for galvanizing.

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4. Remove by blast cleaning or other methods surface contaminants and coatings not removable by normal chemical cleaning process in the galvanizing operation.
 5. Hot-dip galvanize steel members, fabrications, and assemblies after fabrication in accordance with ASTM A123/A123M.
 6. Hot-dip galvanize bolts, nuts, washers, and hardware components in accordance with ASTM A153/A153M. Oversize holes to allow for zinc alloy growth. Shop assemble bolts and nuts.
 7. Galvanized steel sheets in accordance with ASTM A653/A653M.
 8. Galvanize components of bolted assemblies separately before assembly. Galvanizing of tapped holes is not required.
- F. Electrolytic Protection: Coat surfaces of galvanized steel and aluminum fabricated items to be in direct contact with concrete, grout or dissimilar metals, as specified in Section 09 90 00, Painting, unless indicated otherwise.
- G. Fitting: Where movement of fabrications is required or shown, cut, fit, and align items for smooth operation. Make corners square and opposite sides parallel.
- H. Accessories: Furnish as required for a complete installation. Fasten by welding or with stainless steel bolts or screws.

2.06 SOURCE QUALITY CONTROL

- A. Visually inspect all fabrication welds and correct deficiencies.
1. Steel: AWS D1.1/D1.1M, Section 6 and Table 6.1, Visual Inspection Acceptance Criteria.
 2. Aluminum: AWS D1.2/D1.2M.
 3. Stainless Steel: AWS D1.6/D1.6M.

PART 3 EXECUTION

3.01 INSTALLATION OF METAL FABRICATIONS

- A. General:
1. Install metal fabrications plumb and level, accurately fitted, free from distortion or defects.
 2. Install rigid, substantial, and neat in appearance.
 3. Install manufactured products in accordance with manufacturer's recommendations.
 4. Obtain Engineer approval prior to field cutting steel members or making adjustments not scheduled.

B. Aluminum:

1. Do not remove mill markings from concealed surfaces.
2. Remove inked or painted identification marks on exposed surfaces not otherwise coated after installed material has been inspected and approved.
3. Fabrication, mechanical connections, and welded construction shall be in accordance with the AA Aluminum Design Manual.

C. Pipe Sleeves:

1. Provide where pipes pass through concrete or masonry.
2. Holes drilled with a rotary drill may be provided in lieu of sleeves in existing walls.
3. Provide center flange for water stoppage on sleeves in exterior or water-bearing walls.
4. Provide rubber caulking sealant or a modular mechanical unit to form watertight seal in annular space between pipes and sleeves.

3.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Locate and hold anchor bolts in place with templates at time concrete is placed.
- B. Use anchor bolt sleeves for location adjustment and provide two nuts and one washer per bolt of same material as bolt.
- C. Minimum Bolt Size: 1/2-inch diameter by 12 inches long, unless otherwise shown.

3.03 ELECTROLYTIC PROTECTION

A. Aluminum and Galvanized Steel:

1. Coat surfaces of galvanized steel and aluminum fabricated items to be in direct contact with concrete, grout, masonry, or dissimilar metals, as specified in Section 09 90 00, Painting, unless indicated otherwise.
2. Do not apply protective coating to galvanized steel anchor bolts or galvanized steel welded anchor studs, unless indicated otherwise.
3. Allow coating to dry before installation of the material.
4. Protect coated surfaces during installation.
5. Should coating become marred, prepare and touch up in accordance with paint manufacturer's written instructions.

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- B. Titanium: Where titanium equipment is in contact with concrete or dissimilar metal, provide full-face neoprene insulation gasket, 3/32-inch minimum thickness and 70-durometer hardness.
- C. Stainless Steel:
 - 1. During handling and installation, take necessary precautions to prevent carbon impregnation of stainless steel members.
 - 2. After installation, visually inspect stainless steel surfaces for evidence of iron rust, oil, paint, and other forms of contamination.
 - 3. Remove contamination using cleaning and passivation methods in accordance with requirements of ASTM A380 and ASTM A967.
 - 4. Brushes used to remove foreign substances shall utilize only stainless steel or nonmetallic bristles.
 - 5. After treatment, visually inspect surfaces for compliance.

3.04 PAINTING

- A. Painted Galvanized Surfaces: Prepare as specified in Section 09 90 00, Painting.
- B. Repair of Damaged Hot-Dip Galvanized Coating:
 - 1. Conform to ASTM A780/A780M.
 - 2. For minor repairs at abraded areas, use sprayed zinc conforming to ASTM A780/A780M.
 - 3. For flame cut or welded areas, use zinc-based solder, or zinc sticks, conforming to ASTM A780/A780M.
 - 4. Use magnetic gauge to determine thickness is equal to or greater than base galvanized coating.

3.05 FIELD QUALITY ASSURANCE AND QUALITY CONTROL

- A. Contractor-Furnished Quality Control:
 - 1. Inspection and testing required in Section 01 45 16.13, Contractor Quality Control.
 - 2. Manufacturer's Certificate of Compliance per Section 01 61 00, Common Product Requirements, for test results, or calculations, or drawings that ensure material and equipment design and design criteria meet requirements of Section 01 61 00, Common Product Requirements, and Section 01 88 15, Anchorage and Bracing.

3.06 FASTENER SCHEDULE

A. Unless indicated otherwise on Drawings, provide fasteners as follows:

Service Use and Location	Product	Remarks
1. Anchor Bolts Cast Into Concrete for Structural Steel, Metal Fabrications and Castings		
All areas	Steel headed anchor bolts	
2. Anchor Bolts Cast Into Concrete for Equipment Bases		
All areas	Stainless steel headed anchor bolts with fusion bonded coating, unless otherwise specified with equipment	See Section 09 90 00, Painting
3. Post-Installed Anchors: See Section 05 05 19, Post-Installed Anchors		
4. Connections for Structural Steel Framing		
All areas	High-strength steel bolted connections	Use hot-dipped galvanized high-strength bolted connections for galvanized steel framing members.
5. Connections for Steel Fabrications and Wood Components		
All areas	Stainless steel bolted connections	
6. Connections of Aluminum Components		
All areas	Stainless steel bolted connections, unless otherwise specified with equipment	
7. All Others		
All areas	Stainless steel fasteners	

B. Antiseizing Lubricant: Use on stainless steel threads.

END OF SECTION

SECTION 09 90 00
PAINTING

PART 1 GENERAL

1.01 DEFINITIONS

A. Terms Used in this section:

1. Coverage: Total minimum dry film thickness in mils, or square feet per gallon.
2. FRP: Fiberglass Reinforced Plastic.
3. HCl: Hydrochloric Acid.
4. MDFT: Minimum Dry Film Thickness.
5. MDFTPC: Minimum Dry Film Thickness Per Coat.
6. Mil: Thousandth of an inch.
7. Military Specification-Paint.
8. PSDS: Paint System Data Sheet.
9. SFPG: Square Feet Per Gallon.
10. SFPGPC: Square Feet Per Gallon Per Coat.
11. SP: Surface Preparation.

1.02 SUBMITTALS

A. Shop Drawings:

1. Data Sheets:
 - a. For each paint system, furnish a Paint System Data Sheet (PSDS), the manufacturer's Technical Data Sheets, and paint colors available (where applicable) for each product used in the paint system. The PSDS form is appended to the end of this section.
 - b. Submit required information on a system-by-system basis.
 - c. Furnish copies of paint system submittals to the coating applicator.
 - d. Indiscriminate submittal of manufacturer's literature only is not acceptable.

B. Samples:

1. Reference Panel:
 - a. Unless otherwise specified, before painting work is started, prepare minimum 8- by 10-inch samples with type of paint and application specified on similar substrate to which paint is to be applied.

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- b. Furnish additional samples as required until colors, finishes, and textures are approved.
- c. Approved samples to be the quality standard for final finishes.

C. Quality Control Submittals:

1. Applicator's Qualification: List of references substantiating experience.
2. Factory Applied Coatings: Manufacturer's certification stating factory applied coating system meets or exceeds requirements specified.
3. If the manufacturer of finish coating differs from that of shop primer, provide both manufacturers' written confirmation that materials are compatible.
4. Manufacturer's written instructions and special details for applying each type of paint.
5. Manufacturers' Certificate of Proper Installation.

D. Contract Closeout Submittals: Special guarantee.

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Applicator: Minimum 5-years' experience in application of specified products.

B. Regulatory Requirements:

1. Meet federal, state, and local requirements limiting the emission of volatile organic compounds.
2. Perform Surface Preparation and Painting in Accordance with Recommendations of the Following:
 - a. Paint manufacturer's instructions.
 - b. SSPC-PA Guide No. 3, Guide to Safety in Paint Applications.
 - c. Federal, state, and local agencies having jurisdiction.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products in a protected area that is heated or cooled to maintain temperatures within the range recommended by paint manufacturer.

B. Shipping:

1. Where precoated items are to be shipped to the site, protect coating from damage. Batten coated items to prevent abrasion.
2. Use nonmetallic or padded slings and straps in handling.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply paint in temperatures outside of manufacturer's recommended maximum or minimum allowable, or in dust, smoke-laden atmosphere, damp or humid weather.
- B. Do not perform abrasive blast cleaning whenever relative humidity exceeds 85 percent, or whenever surface temperature is less than 5 degrees F above dew point of ambient air.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Coatings Manufacturers Code A (Able to Supply Most Heavy-Duty Industrial Coatings and Architectural Paints):
 - 1. Ameron Protective Coatings, Brea, CA.
 - 2. Carboline Coatings Co., St. Louis, MO.
 - 3. Devoe & Raynolds Co., Louisville, KY.
 - 4. DuPont Chemical Co., Wilmington, DE.
 - 5. Hempel/Reliance Paints, Houston, TX.
 - 6. Keeler and Long, Inc., Watertown, CT.
 - 7. Master Builders, Inc., Cleveland, OH.
 - 8. Pittsburgh Paints, Pittsburgh, PA.
 - 9. Plas-Chem Coatings, St. Louis, MO.
 - 10. Porter-International, Louisville, KY.
 - 11. Sigma Coatings, Inc., Harvey, LA.
 - 12. Tnemec Coatings, Kansas City, MO.
 - 13. Valspar Corp., Azusa, CA.
 - 14. Wisconsin Protective Coatings, Green Bay, WI.

2.02 MATERIALS

- A. General:
 - 1. Material Quality: Manufacturer's highest quality products and suitable for intended service.
 - 2. Materials Including Primer and Finish Coats: Produced by same manufacturer.
 - 3. Thinners, Cleaners, Driers, and Other Additives: As recommended by manufacturer of the particular coating.

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- B. Products are listed below according to their approximate order of appearance in the systems. The letter designating the manufacturer code refers to Article Manufacturers. Not all systems are used on this Project.

Product	Definition	Manufacturer Code
Polyamide Epoxy	Potable grade polyamide epoxy coatings approved for potable water contact and conforming to NSF 61	A
Epoxy Primer	Polyamide, anticorrosive, converted epoxy primer containing rust-inhibitive pigments	A
Coal-Tar Epoxy	Amine or phenolic epoxy type; 70 percent volume solids minimum, suitable for immersion service	A
Organic Zinc Rich Primer	Converted epoxy, epoxy/phenolic or urethane type, minimum 10 pounds metallic zinc content per gallon	A
Wash Primer	Vinyl butyral acid	A
Polyurethane Enamel	Two-component, aliphatic or acrylic based polyurethane; high gloss finish	A
Fusion Bonded Coating	100 percent solids, thermosetting, fusion bonded, dry powder epoxy or polyurethane resin, suitable for the intended service	E
Fusion Bonded, TFE Lube or Grease Lube	Tetrafluoroethylene, liquid coating; No. 62-4621-4830-5 as manufactured by 3M Co., St. Paul, MN; or open gear grease as supplied by McMaster-Carr Co., Elmhurst, IL; RL 736 manufactured by Amrep, Marietta, GA	E
Acrylic Latex	Single component, finish as required.	

2.03 MIXING

- A. Multiple Component Coatings:

1. Prepare using the contents of the container for each component as packaged by paint manufacturer.
2. No partial batches will be permitted.

3. Do not use multiple-component coatings that have been mixed beyond their pot life.
 4. Furnish small quantity kits for touchup painting and for painting other small areas.
 5. Mix only components specified and furnished by paint manufacturer.
 6. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.
- B. Colors: Formulate paints with colorants free of lead, lead compounds, or other materials that might be affected by presence of hydrogen sulfide or other gas likely to be present at the Site.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Surface Preparation Verifications: Inspect and provide substrate surfaces prepared in accordance with these Specifications and the printed directions and recommendations of paint manufacturer whose product is to be applied. The more stringent requirements shall apply.

3.02 PREPARATION

- A. Shop Blast Cleaning: Structural steel, metal doors and frames, metal louvers, and similar items, as reviewed by Owner, may be shop prepared and primed. Centrifugal wheel blast cleaning is an acceptable alternate to shop blast cleaning.
- B. Field Abrasive Blasting: Perform blasting for items and equipment where specified and as required to restore damaged surfaces previously shop or field blasted and primed.
- C. Protection of Items Not to be Painted:
1. Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted.
 2. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.
 3. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.
 4. Mask openings in motors to prevent paint and other materials from entering the motors.

3.03 PREPARATION OF SURFACES

A. Metal Surfaces:

1. Where Indicated, Meet Requirements of the Following SSPC Specifications:
 - a. Solvent Cleaning: SP 1.
 - b. Hand Tool Cleaning: SP 2.
 - c. Power Tool Cleaning: SP 3.
 - d. White Metal Blast Cleaning: SP 5.
 - e. Commercial Blast Cleaning: SP 6.
 - f. Brush-Off Blast Cleaning: SP 7.
 - g. Pickling: SP 8.
 - h. Near-White Blast Cleaning: SP 10.
 - i. Power Tool Cleaning to Bare Metal: SP 11.
2. The words “solvent cleaning,” “hand tool cleaning,” “wire brushing,” and “blast cleaning,” or similar words of equal intent in these Specifications or in paint manufacturer's specifications refer to the applicable SSPC Specifications.
3. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet or vacu-blast methods may be required. Coating manufacturers' recommendations for wet blast additives and first coat application shall apply.
4. Hand tool clean areas that cannot be cleaned by power tool cleaning.
5. Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.
6. Welds and Adjacent Areas:
 - a. Prepare such that there is:
 - 1) No undercutting or reverse ridges on weld bead.
 - 2) No weld spatter on or adjacent to weld or any other area to be painted.
 - 3) No sharp peaks or ridges along weld bead.
 - b. Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.
7. Preblast Cleaning Requirements:
 - a. Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
 - b. Cleaning Methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.
 - c. Clean small isolated areas as above or solvent clean with suitable solvents and clean cloths.

8. Blast Cleaning Requirements:
 - a. Type of Equipment and Speed of Travel: Design to obtain specified degree of cleanliness. Minimum surface preparation is as specified herein and takes precedence over coating manufacturer's recommendations.
 - b. Select type and size of abrasive to produce a surface profile that meets coating manufacturer's recommendations for particular primer to be used.
 - c. Use only dry blast cleaning methods.
 - d. Do not reuse abrasive, except for designed recyclable systems.
 - e. Meet applicable federal, state, and local air pollution and environmental control regulations for blast cleaning, confined space entry (if required), and disposition of spent aggregate and debris.
9. Post-Blast Cleaning and Other Cleaning Requirements:
 - a. Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wipe with a tack cloth.
 - b. Paint surfaces the same day they are blasted. Reblast surfaces that have started to rust before they are painted.

B. Plastic Surfaces:

1. Hand sand plastic surfaces to be coated with a medium grit sandpaper to provide tooth for the coating system.
2. Large areas may be power sanded or brushoff blasted, provided sufficient controls are employed so surface is roughened without removing excess material.

3.04 SURFACE CLEANING METHODS

A. Brushoff Blast Cleaning:

1. Equipment, procedure, and degree of cleaning shall meet requirements of SSPC-SP 7, Brushoff Blast Cleaning.
2. Abrasive: Either wet or dry blasting sand, grit, or nut shell.
3. Select various surface preparation parameters such as size and hardness of abrasive, nozzle size, air pressure, and nozzle distance from surface such that surface is cleaned without pitting, chipping, or other damage.
4. Verify parameter selection by blast cleaning a trial area that will not be exposed to view.

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5. Owner will approve acceptable trial blast cleaned area and will use area as a representative sample of surface preparation.
6. Repair or replace surfaces damaged by blast cleaning.

B. Acid Etching:

1. After precleaning, spread the following solution by brush or plastic sprinkling can: One part commercial muriatic acid reduced by two parts water by volume. Adding acid to water in these proportions gives an approximate 10 percent solution of HCl.
2. Application:
 - a. Application Rate: Approximately 2 gallons per 100 square feet.
 - b. Work acid solution into surface by hard-bristled brushes or brooms until complete wetting and coverage is obtained.
 - c. Acid will react vigorously for a few minutes, during which time brushing is continued.
 - d. After bubbling subsides (10 minutes), hose down the remaining slurry with high pressure clean water.
 - e. Rinse immediately to avoid formation on the surface of salts that are difficult to remove.
 - f. Thoroughly rinse to remove any residual acid surface condition which can impair adhesion.
3. Ensure surface is completely dry before application of coating.
4. Apply acid etching, to obtain a "grit sandpaper" surface profile. If not, repeat treatment.

C. Solvent Cleaning:

1. Consists of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by using solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods which involve a solvent or cleaning action.
2. Meets requirements of SSPC-SP 1.

3.05 APPLICATION

A. General:

1. The intention of these Specifications is for new, interior and exterior masonry, concrete, and metal surfaces to be painted, whether specifically mentioned or not, except as specified otherwise. Prime coat structural steel surfaces.

2. For coatings subject to immersion, obtain full cure for completed system. Consult coatings manufacturer's written instructions for these requirements. Do not immerse coating for any purpose until completion of curing cycle.
3. Apply coatings in accordance with these Specifications and the paint manufacturers' printed recommendations and special details. The more stringent requirements shall apply. Allow sufficient time between coats to assure thorough drying of previously applied paint.
4. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
5. Sand metal lightly between coats to achieve required finish.
6. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
7. Fusion Bonded Coatings Method Application: Electrostatic, fluidized bed, or flocking.
8. Coat units or surfaces to be bolted together or joined closely to structures or to one another prior to assembly or installation.
9. Water-Resistant Gypsum Wallboard: Use only solvent type paints and coatings.
10. On pipelines, terminate coatings along pipe runs to 1 inch inside pipe penetrations.
11. Keep paint materials sealed when not in use.
12. Where more than one coat of a material is applied within a given system, alternate color to provide a visual reference that the required number of coats have been applied.

B. Shop Primed and Factory Finished Surfaces:

1. Schedule inspection with Owner before shop priming or topcoating factory finished items delivered to Site.
2. Prepare surfaces and spot prime using specified primer.
3. Apply mist coat of primer, 1-mil dry film thickness.
4. After welding, prepare and prime holdback areas as required for paint system. Apply primer in accordance with manufacturer's instructions.

C. Manufacturer Applied Paint Systems:

1. Repair abraded areas on factory finished items as recommended by manufacturer.
2. Carefully blend repaired areas into original finish.
3. Fusion Bonded Coatings: Provide appropriate liquid repair kits for field use.

D. Film Thickness:

1. Number of Coats: Minimum required without regard to coating thickness. Additional coats may be required to obtain minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.
2. Maximum film build per coat shall not exceed coating manufacturer's recommendations.
3. Film thickness measurements and electrical inspection of coated surfaces:
 - a. Perform with properly calibrated instruments.
 - b. Recoat and repair as necessary for compliance with the Specifications.
 - c. All coats are subject to inspection by Owner and coating manufacturer's representative.
4. Visually inspect concrete, nonferrous metal, plastic, and wood surfaces to ensure proper and complete coverage has been attained.
5. Give particular attention to edges, angles, flanges, and other similar areas, where insufficient film thicknesses are likely to be present, and ensure proper millage in these areas.
6. Thickness Testing:
 - a. After repaired and recoated areas have dried sufficiently, final tests will be conducted by Owner.
 - b. Measure coating thickness specified in mils with a magnetic type dry film thickness gauge.
 - c. Test finish coat, except zinc primer, galvanizing, and elastomeric coatings in excess of 25 mils dry, for holidays and discontinuities with an electrical holiday detector.
 - d. Holiday detect coatings in excess of 25 mils dry with high voltage units recommended by the coating manufacturer.
 - e. Check each coat for correct millage. Do not make measurement before a minimum of 8 hours after application of coating.

E. Damaged Coatings, Pinholes, and Holidays:

1. Feather edges and repair in accordance with recommendations of paint manufacturer.
2. Apply finish coats, including touchup and damage-repair coats in a manner which will present a uniform texture and color-matched appearance.

F. Unsatisfactory Application:

1. If item has an improper finish color, or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified color and coverage. Obtain specific surface preparation information from coating manufacturer.
2. Hand or power sand visible areas of chipped, peeled, or abraded paint, and feather the edges. Follow with primer and finish coat. Depending on extent of repair and appearance, a finish sanding and topcoat may be required.
3. Evidence of runs, bridges, shiners, laps, or other imperfections is cause for rejection.
4. Repair defects in accordance with written recommendations of coating manufacturer.
5. Leave staging and lighting up until Owner has inspected surface or coating. Replace staging removed prior to approval by Owner. Provide additional staging and lighting as requested by Owner.

3.06 CLEANUP

- A. Place cloths and waste that might constitute a fire hazard in closed metal containers or destroy at the end of each day.
- B. Upon completion of the Work, remove staging, scaffolding, and containers from the site or destroy in a legal manner.
- C. Completely remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.

3.07 PROTECTIVE COATINGS SYSTEMS

- A. System No. 5A Exposed and Submerged Ductile Iron Pipe and Valves

Surface Prep.	Paint Material	Min. Coats, Cover
Solvent Clean (SP 1) Followed by Power Tool (SP 3). Abrade all surfaces per recommended surface profile.	Prime coat: All factory primed metal with Tnemec Series N140 Pota-Pox Plus	1 coat, 3-5 MDFT
	Stripe coat: All edges with 2-inch roller using Tnemec Series N140 Pota-Pox Plus	1 coat, 4-6 MDFT
	Final coat: All exposed surfaces with Tnemec Series 1095	1 coat, 3-5 MDFT

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B. System No. 6 Exposed and Concrete Encased Portions of Well Casing,
Wellhead Flange, and Discharge Head

Surface Prep.	Paint Material	Min. Coats, Cover
Remove all dirt, oils, grease by high pressure water blast cleaning, (3,000 psi, 3-5 gpm). Grind all weld seams and rough edges smooth. Remove all loose rust and remaining old coatings with SP 10, Near-White Blast Cleaning.	Prime coat: All bare metal with Tnemec Series 135	1 coat, 4-6 MDFT
	Stripe coat: All edges with 2-inch roller using Tnemec Series 135	1 coat, 4-6 MDFT
	Final coat: All exposed surfaces with Tnemec Series 1095	1 coat, 3-5 MDFT

A. System No. 7 Exposed Metal

Surface Prep.	Paint Material	Min. Coats, Cover
Remove all dirt, oils, grease, and loose rust by Solvent Cleaning (SP 1) and Hand Tool (SP 2)	Stripe coat: All sharp edges with 2-inch roller using Tnemec Series 135	1 coat, 3-5 MDFT
	Full prime: All exterior surfaces with Tnemec Series 135	1 coat, 3-5 MDFT
	Full finish: All exterior surfaces with Tnemec Series 1095, Semi-gloss. Provide a color chart for Owner selection of finish color.	1 coat, 2.5-4 MDFT

B. System No. 10 Galvanized Metal Conditioning:

Surface Prep.	Paint Material	Min. Coats, Cover
Solvent Clean (SP 1) Followed by Hand Tool (SP 2) or Power Tool (SP 3)	Wash Primer or Coating Manufacturer's Recommendation	1 coat, 0.4 MDFT

C. System No. 25 Exposed FRP, PVC:

Surface Prep.	Paint Material	Min. Coats, Cover
In accordance with Paragraph Plastic and FRP Surface Preparation	Acrylic Latex Flat	2 coats, 320 SFPGPC

D. System No. 27 Aluminum and Dissimilar Metal Insulation:

Surface Prep.	Paint Material	Min. Coats, Cover
Solvent Clean (SP1)	Wash Primer	1 coat, 0.4 MDFT
	Bituminous Paint	1 coat, 10 MDFT

3.08 APPLICATION SCHEDULE

A. System No. 5A Exposed and Submerged Ductile Iron Pipe and Valves: Use on the following items or areas:

1. Exposed piping and valves, exterior.

B. System No. 6 Exposed and Concrete Encased Portions of Well Casing, Wellhead Flange, and Discharge Head: Use on the following items or areas:

1. Well casing and flange, exterior.
2. Discharge head, exterior.

C. System No. 7 Exposed Metal: Use on the following items or areas:

1. Exposed metal surfaces, exterior.
2. MCC Cabinet.

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- D. System No. 10 Galvanized Metal Conditioning: Use on the following items or areas:
1. Galvanized surfaces requiring painting.
- E. System No. 25 Exposed FRP, PVC: Use on the following items or areas:
1. All exposed-to-view PVC and CPVC surfaces, and FRP surfaces without integral UV-resistant gel coat.
- F. System No. 27 Aluminum and Dissimilar Metal Insulation: Use on concrete-embedded aluminum surfaces.
- G. Surfaces Not Requiring Painting: Unless otherwise stated or shown, the following areas or items will not require painting or coating:
1. Reinforcing steel.
 2. Nonferrous and corrosion-resistant ferrous alloys such as copper, bronze, monel, aluminum, chromium plate, atmospherically exposed weathering steel, and stainless steel, except where:
 - a. Required for electrical insulation between dissimilar metals.
 - b. Aluminum and stainless steel are embedded in concrete or masonry, or aluminum is in contact with concrete or masonry.
 - c. Color coding of equipment and piping is required.
 3. Nonmetallic materials such as glass, PVC, wood, porcelain, and plastic (FRP) except as required for architectural painting or color coding.
 4. Prefinished electrical and architectural items such as motor control centers, switchboards, switchgear, panelboards, transformers, disconnect switches (if prefinished in OSHA yellow), acoustical tile, cabinets, elevators, building louvers, and wall panels; color coding of equipment is required.
 5. Nonsubmerged electrical conduits attached to unpainted concrete surfaces.
 6. Cathodic protection anodes.
 7. Items specified to be galvanized after fabrication, unless specified elsewhere or subject to immersion.
 8. Insulated piping and insulated piping with jacket will not require exterior coating, except as required for architectural painting or color coding.

3.09 COLORS

- A. Pipe Identification Painting:
 - 1. Color code nonsubmerged metal piping except electrical conduit. Paint fittings and valves the same color as pipe, except equipment isolation valves.
 - 2. Piping Color Coding: As directed by Owner.
 - a. Exposed Raw Water Piping and Appurtenances – Olive Green.
- B. Proprietary identification of colors is for identification only. Selected manufacturer may supply matches.
- C. Equipment Colors:
 - 1. Equipment includes the machinery or vessel itself plus the structural supports and fasteners and attached electrical conduits.
 - 2. Paint Nonsubmerged Portions of Equipment the Same Color as the Piping it Serves, Except as Itemized Below:
 - a. Dangerous Parts of Equipment and Machinery: OSHA Orange.
 - b. Fire Protection Equipment and Apparatus: OSHA Red.
 - c. Physical hazards in normal operating area and energy lockout devices, including, but not limited to, electrical disconnects for equipment and equipment isolation valves in air and liquid lines under pressure: OSHA Yellow.

3.10 SUPPLEMENTS

- A. The supplement listed below, following “END OF SECTION,” is part of this Specification.
 - 1. Paint System Data Sheet.

END OF SECTION

PAINT SYSTEM DATA SHEET

Complete and attach manufacturer's Technical Data Sheet to this PSDS for each coating system.

Paint System Number (from Spec.):		
Paint System Title (from Spec.):		
Coating Supplier:		
Representative:		
Surface Preparation:		
Paint Material (Generic)	Product Name/Number (Proprietary)	Min. Coats, Coverage

SECTION 26 05 02
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 RELATED SECTIONS

- A. Requirements specified within this section apply to Division 26, Electrical. Work specified herein shall be performed as if specified in the individual sections.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. National Electrical Contractors Association (NECA): National Electrical Installation Standards.
 2. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - b. Z535.4, Product Safety Signs and Labels.
 3. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).

1.03 ELECTRIC SERVICE DIVISION OF RESPONSIBILITY

- A. Incoming primary underground electrical service and pad mounted transformer provided by the serving utility as part of its normal obligation to customers is work provided outside this Contract. Under this Contract, provide customer required service provisions and electrical work including, but not limited to, secondary feeder from utility transformer to service entrance disconnect switch, metering components, 200-Amp service entrance rated fused disconnect, and associated conduit, and secondary facilities. Schedule and coordinate work of serving utility as required to provide electric service to the Work.

1.04 QUALITY ASSURANCE

- A. Provide the Work in accordance with NFPA 70. Where required by Authority Having Jurisdiction (AHJ), material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ, in order to provide a basis for approval under the NEC.
- B. Materials and equipment manufactured within the scope of standards published by UL shall conform to those standards and shall have an applied UL listing mark or label.

PART 2 PRODUCTS

2.01 GENERAL

- A. Where two or more units of the same class of material or equipment are required, provide products of a single manufacturer. Component parts of materials or equipment need not be products of the same manufacturer.
- B. Material and equipment installed in heated and ventilated areas shall be capable of continuous operation at their specified ratings within an ambient temperature range of 40 degrees F to 104 degrees F.
- C. Materials and equipment installed outdoors shall be capable of continuous operation at their specified rating within the ambient temperature range stated in Section 01 61 00, Common Product Requirements.

2.02 EQUIPMENT FINISH

- A. Manufacturer's standard finish color, except where specific color is indicated. If manufacturer has no standard color, finish equipment in light gray color finish, as approved by Engineer.

2.03 NAMEPLATES

- A. Material: Laminated plastic.
- B. Attachment Screws:
 - 1. Stainless steel.
 - 2. Adhesive: Single-part, room temperature vulcanizing adhesive suitable for the environment and materials installed. Use adhesive on NEMA 4 or NEMA 4X enclosures only.
- C. Color: White, engraved to a black core.
- D. Letter Height:
 - 1. Pushbuttons/Selector Switches: 1/8 inch.
 - 2. Other Electrical Equipment: 1/4 inch.

2.04 SIGNS AND LABELS

- A. Sign size, lettering, and color shall be in accordance with NEMA Z535.4.

PART 3 EXECUTION

3.01 GENERAL

- A. Electrical Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned. Contractor shall be responsible for actual location of equipment and devices and for proper routing and support of raceways, subject to approval of Engineer.
- B. Check approximate locations of light fixtures, switches, electrical outlets, equipment, and other electrical system components shown on Drawings for conflicts with openings, structural members, and components of other systems and equipment having fixed locations. In the event of conflicts, notify Engineer in writing.
- C. Install work in accordance with NECA Standard of Installation, unless otherwise specified.
- D. Keep openings in boxes and equipment closed during construction.
- E. Lay out work carefully in advance. Do not cut or notch any structural member or building surface without specific approval of Engineer. Carefully perform cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, paving, or other surfaces required for the installation, support, or anchorage of conduit, raceways, or other electrical materials and equipment. Following such work, restore surfaces to original condition.

3.02 ANCHORING, BRACING, AND MOUNTING

- A. Equipment anchoring and mounting shall be in accordance with manufacturer's requirements for Project design criteria provided in Section 01 61 00, Common Product Requirements.

3.03 COMBINING CIRCUITS INTO COMMON RACEWAY

- A. Drawings show each homerun circuit to be provided. Do not combine power or control circuits into common raceways without authorization of Engineer.

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- B. Homerun circuits shown on Drawings indicate functional wiring requirements for power and control circuits. Circuits may be combined into common raceways in accordance with the following requirements:
1. Analog control circuits from devices in same general area to same destination.
 - a. No power or ac discrete control circuits shall be combined in same conduit with analog circuits.
 - b. No Class 2 or Class 3 circuits including, but not limited to, HVAC control circuits, fire alarm circuits, paging system circuits shall be combined with power or Class 1 circuits.
 - c. Analog circuits shall be continuous from source to destination. Do not add TJB, splice, or combine into a multi-pair cable without authorization of Engineer.
 - d. Raceways shall be sized per General Circuit and Raceway Schedule and do not exceed 40 percent fill.
 - e. Changes shall be documented on record drawings.
 2. Discrete control circuits from devices in the same general area to the same destination.
 - a. No power or analog control circuits shall be combined in same conduit with discrete circuits.
 - b. No Class 2 or Class 3 circuits including, but not limited to, HVAC control circuits, fire alarm circuits, and paging system circuits shall be combined with power or Class 1 circuits.
 - c. Raceways shall be sized per the General Circuit and Raceway Schedule and do not exceed 40 percent fill.
 - d. Changes shall be documented on record drawings.
 3. Power circuits from loads in same general area to same source location (such as: panelboard, switchboard, low voltage motor control center).
 - a. Lighting Circuits: Combine no more than three circuits to a single raceway. Contractor shall be responsible for increasing conduit and conductor size if derating is required by NEC.
 - b. Receptacle Circuits, 120 Volt Only: Combine no more than three circuits to a single raceway. Provide a separate neutral conductor for each circuit. Contractor shall be responsible for increasing conduit and conductor size if derating is required by NEC.
 - c. All Other Power Circuits: Do not combine power circuits without authorization of Engineer.

3.04 NAMEPLATES, SIGNS, AND LABELS

A. Arc Flash Protection Warning Signs:

1. Field mark panelboards, main circuit breaker, and pump control panel to warn qualified persons of potential arc-flash hazards. Locate marking so to be clearly visible to persons before working on energized equipment.
2. Use arc flash hazard boundary, energy level, PPE level and description, shock hazard, bolted fault current, and equipment name from study required in Section 26 05 70, Electrical Systems Analysis as basis for warning signs.

B. Available Fault Current Signs:

1. Install label on service equipment to indicate the maximum available fault current at the equipment. Labels shall be of sufficient durability for the environment in which the equipment is installed. Labels shall include the following information:
 - a. Equipment name or identification.
 - b. Available fault current at the equipment.
 - c. Date the fault current calculations were performed.
2. Use bolted fault current and equipment name from study required in Section 26 05 70, Electrical Systems Analysis, as basis for the label.
3. Where existing electrical systems are modified, completely remove existing fault current labels if present, and install new labels in accordance with the above requirements.

C. Equipment Nameplates:

1. Provide a nameplate to label electrical equipment including switchgear, switchboards, motor control centers, panelboards, automatic transfer switches, generators, mini-power zones, motor starters, transformers, terminal junction boxes, disconnect switches, switches and control stations.
2. Switchgear, motor control center, transformer, and terminal junction box nameplates shall include equipment designation.
3. Disconnect switch, starter, and control station nameplates shall include name and number of equipment powered or controlled by that device.
4. Switchboard and panelboard nameplates shall include equipment designation, service voltage, and phases.

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3.05 LOAD BALANCE

- A. Drawings and Specifications indicate circuiting to electrical loads and distribution equipment.
- B. Balance electrical load between phases as nearly as possible on switchboards, panelboards, motor control centers, and other equipment where balancing is required.
- C. When loads must be reconnected to different circuits to balance phase loads, maintain accurate record of changes made, and provide circuit directory that lists final circuit arrangement.

3.06 CLEANING AND TOUCHUP PAINTING

- A. Cleaning: Throughout the Work, clean interior and exterior of devices and equipment by removing debris and vacuuming.
- B. Touchup Paint:
 - 1. Touchup scratches, scrapes and chips on exterior and interior surfaces of devices and equipment with finish matching type, color, and consistency and type of surface of original finish.
 - 2. If extensive damage is done to equipment paint surfaces, refinish entire equipment in a manner that provides a finish equal to or better than factory finish, that meets requirements of Specification, and is acceptable to Engineer.

3.07 PROTECTION FOLLOWING INSTALLATION

- A. Protect materials and equipment from corrosion, physical damage, and effects of moisture on insulation and contact surfaces.
- B. When equipment intended for indoor installation is installed at Contractor's convenience in areas where subject to dampness, moisture, dirt or other adverse atmosphere until completion of construction, ensure adequate protection from these atmospheres is provided and acceptable to Engineer.

END OF SECTION

SECTION 26 05 04
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. A1011/A1011M, Standard Specification for Steel, Sheet, and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low Alloy and High-Strength Low Alloy Formability.
 - b. E814, Method of Fire Tests of Through-Penetration Fire Stops.
 2. Canadian Standards Association (CSA).
 3. Institute of Electrical and Electronics Engineers, Inc. (IEEE): 18, Standard for Shunt Power Capacitors.
 4. International Society of Automation (ISA): RP12.06.01, Wiring Practices for Hazardous (Classified) Locations Instrumentation–Part 1: Intrinsic Safety.
 5. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - b. C12.1, Code for Electricity Metering.
 - c. C12.6, Phase-Shifting Devices Used in Metering, Marking and Arrangement of Terminals.
 - d. ICS 2, Industrial Control and Systems: Controllers, Contactors, and Overload Relays Rated 600 Volts.
 - e. ICS 5, Industrial Control and Systems: Control Circuit and Pilot Devices.
 - f. KS 1, Enclosed and Miscellaneous Distribution Switches (600 Volts Maximum).
 6. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).
 7. Underwriters Laboratories, Inc. (UL):
 - a. 98, Standard for Enclosed and Dead-Front Switches.
 - b. 248, Standard for Low Voltage Fuses.
 - c. 486E, Standard for Equipment Wiring Terminals for use with Aluminum and/or Copper Conductors.
 - d. 489, Standard for Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures.
 - e. 508, Standard for Industrial Control Equipment.

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- f. 810, Standard for Capacitors.
- g. 943, Standard for Ground-Fault Circuit-Interruption.
- h. 1059, Standard for Terminal Blocks.
- i. 1479, Fire Tests of Through-Penetration Fire Stops.

1.02 SUBMITTALS

A. Action Submittals:

- 1. Provide manufacturers data for the following:
 - a. Control devices.
 - b. Control relays.
 - c. Circuit breakers.
 - d. Non-fused switches.
 - e. Firestopping.

1.03 EXTRA MATERIALS

A. Furnish, tag, and box for shipment and storage the following spare parts and special tools:

- 1. Fuses, 0 Volt to 600 Volts: Six of each type and each current rating installed.

PART 2 PRODUCTS

2.01 MOLDED CASE CIRCUIT BREAKER THERMAL MAGNETIC, LOW VOLTAGE

A. General:

- 1. Type: Molded case.
- 2. Trip Ratings: 15 amps to 800 amps.
- 3. Voltage Ratings: 120, 240, 277, 480, and 600V ac.
- 4. Suitable for mounting and operating in any position.
- 5. UL 489.

B. Operating Mechanism:

- 1. Overcenter, trip-free, toggle type handle.
- 2. Quick-make, quick-break action.
- 3. Locking provisions for padlocking breaker in OPEN position.
- 4. ON/OFF and TRIPPED indicating positions of operating handle.
- 5. Operating handle to assume a CENTER position when tripped.

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- C. Trip Mechanism:
1. Individual permanent thermal and magnetic trip elements in each pole.
 2. Variable magnetic trip elements with a single continuous adjustment 3X to 10X for frames greater than 100 amps.
 3. Two and three pole, common trip.
 4. Automatically opens all poles when overcurrent occurs on one pole.
 5. Test button on cover.
 6. Calibrated for 40 degrees C ambient, unless shown otherwise.
 7. Do not provide single-pole circuit breakers with handle ties where multi-pole circuit breakers are shown.
- D. Short Circuit Interrupting Ratings:
1. All new 480V equipment shall include a minimum short circuit rating of 35,000A. All new 208/120V equipment shall include a short circuit rating of 22,000A.
 2. Series Connected Ratings: Do not apply series connected short circuit ratings.
- E. Ground Fault Circuit Interrupter (GFCI): Where indicated, equip breaker as specified above with ground fault sensor and rated to trip on 5-mA ground fault within 0.025 second (UL 943, Class A sensitivity, for protection of personnel).
1. Ground fault sensor shall be rated same as circuit breaker.
 2. Push-to-test button.
- F. Equipment Ground Fault Interrupter (EGFI): Where indicated, equip breaker specified above with ground fault sensor and rated to trip on 30-mA ground fault (UL-listed for equipment ground fault protection).
- G. Accessories: Shunt trip, auxiliary switches, handle lock ON devices, mechanical interlocks, key interlocks, unit mounting bases, double lugs as shown or otherwise required. Shunt trip operators shall be continuous duty rated or have coil-clearing contacts.
- H. Connections:
1. Supply (line side) at either end.
 2. Mechanical wire lugs, except crimp compression lugs where shown.
 3. Lugs removable/replaceable for breaker frames greater than 100 amperes.
 4. Suitable for 75 degrees C rated conductors without derating breaker or conductor ampacity.

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- I. Enclosures for Independent Mounting:
 - 1. See Article Enclosures.
 - 2. Service Entrance Use: Breakers in required enclosure and required accessories shall be UL 489 listed.
 - 3. Interlock: Enclosure and switch shall interlock to prevent opening cover with switch in the ON position. Provide bypass feature for use by qualified personnel.

2.02 FUSED SWITCH, INDIVIDUAL, LOW VOLTAGE

- A. UL 98 listed for use and location of installation.
- B. NEMA KS 1.
- C. Short Circuit Rating: 200,000 amps rms symmetrical with Class R, Class J, or Class L fuses installed.
- D. Quick-make, quick-break, motor rated, load-break, heavy-duty (HD) type with external markings clearly indicating ON/OFF positions.
- E. Connections:
 - 1. Mechanical lugs, except crimp compression lugs where shown.
 - 2. Lugs removable/replaceable.
 - 3. Suitable for 75 degrees C rated conductors at NEC 75 degrees C ampacity.
- F. Fuse Provisions:
 - 1. 30-amp to 600-amp rated shall incorporate rejection feature to reject all fuses except Class R.
 - 2. 601-amp rated and greater shall accept Class L fuses, unless otherwise shown.
- G. Enclosures: See Article Enclosures.
- H. Interlock: Enclosure and switch to prevent opening cover with switch in ON position. Provide bypass feature for use by qualified personnel.

2.03 NONFUSED SWITCH, INDIVIDUAL, LOW VOLTAGE

- A. NEMA KS 1.
- B. Quick-make, quick-break, motor rated, load-break, heavy-duty (HD) type with external markings clearly indicating ON/OFF positions.

- C. Lugs: Suitable for use with 75 degrees C wire at NEC 75 degrees C ampacity.
- D. Auxiliary Contact:
 - 1. Operation: Make before power contacts make and break before power contacts break.
 - 2. Contact Rating: 7,200VA make, 720VA break, at 600V, NEMA ICS 5 Designation A600.
- E. Enclosures: See Article Enclosures.
- F. Interlock: Enclosure and switch to prevent opening cover with switch in ON position. Provide bypass feature for use by qualified personnel.

2.04 FUSE, 250-VOLT AND 600-VOLT

- A. Power Distribution, General:
 - 1. Current-limiting, with 200,000 ampere rms interrupting rating.
 - 2. Provide to fit mountings specified with switches.
 - 3. UL 248.
- B. Power Distribution, Ampere Ratings 1 Amp to 600 Amps:
 - 1. Class: RK-1.
 - 2. Type: Dual element, with time delay.
 - 3. Manufacturers and Products:
 - a. Bussmann; Types LPS-RK (600 volts) and LPN-RK (250 volts).
 - b. Littelfuse; Types LLS-RK (600 volts) and LLN-RK (250 volts).
- C. Power Distribution, Ampere Ratings 601 Amps to 6,000 Amps:
 - 1. Class: L.
 - 2. Double O-rings and silver links.
 - 3. Manufacturers and Products:
 - a. Bussmann; Type KRP-C.
 - b. Littelfuse, Inc.; Type KLPC.
- D. Cable Limiters:
 - 1. 600V or less; crimp to copper cable, bolt to bus or terminal pad.
 - 2. Manufacturer and Product: Bussmann; K Series.

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- E. Ferrule:
1. 600V or less, rated for applied voltage, small dimension.
 2. Ampere Ratings: 1/10 amp to 30 amps.
 3. Dual-element time-delay, time-delay, or nontime-delay as required.
 4. Provide with blocks or holders as indicated and suitable for location and use.
 5. Manufacturers:
 - a. Bussmann.
 - b. Littelfuse, Inc.

2.05 PUSHBUTTON, INDICATING LIGHT, AND SELECTOR SWITCH

- A. Contact Rating: 7,200VA make, 720VA break, at 600V, NEMA ICS 5 Designation A600.
- B. Selector Switch Operating Lever: Standard.
- C. Indicating Light: Push-to-test.
- D. Pushbutton Color:
1. ON or START: Black.
 2. OFF or STOP: Red.
- E. Pushbutton and selector switch lockable in OFF position where indicated.
- F. Legend Plate:
1. Material: Aluminum.
 2. Engraving: Enamel filled in high contrasting color.
 3. Text Arrangement: 11-character/spaces on one line, 14-character/spaces on each of two lines, as required, indicating specific function.
 4. Letter Height: 7/64 inch.
- G. Manufacturers and Products:
1. Heavy-Duty, Oil-Tight Type:
 - a. General Electric Co.; Type CR 104P.
 - b. Square D Co.; Type T.
 - c. Eaton/Cutler-Hammer; Type 10250T.
 2. Heavy-Duty, Watertight, and Corrosion-Resistant Type:
 - a. Square D Co.; Type SK.
 - b. General Electric Co.; Type CR 104P.
 - c. Eaton/Cutler-Hammer; Type E34.
 - d. Crouse-Hinds; Type NCS.

2.06 TERMINAL BLOCK, 600 VOLTS

- A. UL 486E and UL 1059.
- B. Size components to allow insertion of necessary wire sizes.
- C. Capable of termination of control circuits entering or leaving equipment, panels, or boxes.
- D. Screw clamp compression, dead front barrier type, with current bar providing direct contact with wire between compression screw and yoke.
- E. Yoke, current bar, and clamping screw of high strength and high conductivity metal.
- F. Yoke shall guide all strands of wire into terminal.
- G. Current bar shall ensure vibration-proof connection.
- H. Terminals:
 - 1. Capable of wire connections without special preparation other than stripping.
 - 2. Capable of jumper installation with no loss of terminal or rail space.
 - 3. Individual, rail mounted.
- I. Marking system, allowing use of preprinted or field-marked tags.
- J. Manufacturers:
 - 1. Weidmuller, Inc.
 - 2. Ideal.
 - 3. Electrovert USA Corp.

2.07 MAGNETIC CONTROL RELAY

- A. Industrial control with field convertible contacts rated 10 amps continuous, 7,200VA make, 720VA break.
- B. NEMA ICS 2, Designation: A600 (600 volts).
- C. Time Delay Relay Attachment:
 - 1. Pneumatic type, timer adjustable as shown.
 - 2. Field convertible from ON delay to OFF delay and vice versa.

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- D. Latching Attachment: Mechanical latch, having unlatching coil and coil clearing contacts.
- E. Manufacturers and Products:
 - 1. Eaton/Cutler-Hammer; D26 Type M.
 - 2. General Electric Co.; Type CR120B.
 - 3. Square D; Type X.

2.08 TIME DELAY RELAY

- A. Industrial relay with contacts rated 5 amps continuous, 3,600VA make, 360VA break.
- B. NEMA ICS 2 Designation: B150 (150 volts).
- C. Solid-state electronic, field convertible ON/OFF delay.
- D. One normally open and one normally closed contact (minimum).
- E. Repeat accuracy plus or minus 2 percent.
- F. Timer adjustment from 1 second to 60 seconds, unless otherwise indicated on Drawings.
- G. Manufacturers and Products:
 - 1. Square D Co.; Type XO.
 - 2. Eaton/Cutler-Hammer; Type D26MR.
 - 3. General Electric Co.; Type CR120.

2.09 RESET TIMER

- A. Drive: Synchronous motor, solenoid-operated clutch.
- B. Mounting: Semiflush panel.
- C. Contacts: 10 amps, 120 volts.
- D. Manufacturers and Products:
 - 1. Eagle Signal Controls; Bulletin 125.
 - 2. Automatic Timing and Controls; Bulletin 305.

2.10 ELAPSED TIME METER

- A. Drive: Synchronous motor.
- B. Range: 0 hour to 99,999.9 hours, nonreset type.
- C. Mounting: Semiflush panel.
- D. Manufacturers and Products:
 - 1. General Electric Co.; Type 240, 2-1/2-inch Big Look.
 - 2. Eagle Signal Controls; Bulletin 705.

2.11 PHASE MONITOR RELAY

- A. Features:
 - 1. Voltage and phase monitor relay shall drop out on low voltage, voltage unbalance, loss of phase, or phase reversal.
 - 2. Contacts: Single-pole, double-throw, 10 amperes, 120/240V ac. Where additional contacts are shown or required, provide magnetic control relays.
 - 3. Adjustable trip and time delay settings.
 - 4. Transient Protection: 1,000V ac.
 - 5. Mounting: Multipin plug-in socket base.
- B. Manufacturer and Product: Automatic Timing and Controls; SLD Series.

2.12 SUPPORT AND FRAMING CHANNELS

- A. Carbon Steel Framing Channel:
 - 1. Material: Rolled, mild strip steel, 12-gauge minimum, ASTM A1011/A1011M, Grade 33.
 - 2. Finish: Hot-dip galvanized after fabrication.
- B. Paint Coated Framing Channel: Carbon steel framing channel with electro-deposited rust inhibiting acrylic or epoxy paint.
- C. PVC-Coated Framing Channel: Carbon steel framing channel with 40-mil polyvinyl chloride coating.
- D. Stainless Steel Framing Channel: Rolled, Type 316 stainless steel, 12-gauge minimum.

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- E. Extruded Aluminum Framing Channel:
 - 1. Material: Extruded from Type 6063-T6 aluminum alloy.
 - 2. Fittings fabricated from Alloy 5052-H32.

- F. Nonmetallic Framing Channel:
 - 1. Material: Fire retardant, fiber reinforced vinyl ester resin.
 - 2. Channel fitting of same material as channel.
 - 3. Nuts and bolts of long glass fiber reinforced polyurethane.

- G. Manufacturers:
 - 1. B-Line Systems, Inc.
 - 2. Unistrut Corp.
 - 3. Aickinstrut.

2.13 INTRINSIC SAFETY BARRIER

- A. Provides a safe energy level for exposed wiring in a Class I, Division 1 or Division 2 hazardous area when circuit is connected to power source in nonhazardous area.

- B. Rating: Power source shall be rated 24 volts dc, nominal, with not more than 250 volts available under fault conditions.

- C. Contact Rating: 5 amps, 250 volts ac.

- D. Mounting: Rail or surface.

- E. Manufacturers and Products:
 - 1. MTL, Inc.; Series 2000 or Series 3000.
 - 2. R. Stahl, Inc.

2.14 FIRESTOPS

- A. General:
 - 1. Provide UL 1479 classified hourly fire rating equal to, or greater than, the assembly penetrated.
 - 2. Prevent the passage of cold smoke, toxic fumes, and water before and after exposure to flame.
 - 3. Sealants and accessories shall have fire-resistance ratings as established by testing identical assemblies in accordance with ASTM E814, by Underwriters Laboratories, Inc., or other testing and inspection agency acceptable to authorities having jurisdiction.

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B. Firestop System:

1. Formulated for use in through-penetration firestopping around cables, conduit, pipes, and duct penetrations through fire-rated walls and floors.
2. Fill, Void, or Cavity Material: 3M Brand Fire Barrier Caulk CP25, Putty 303, Wrap/Strip FS195, Composite Sheet CS195 and Penetration Sealing Systems 7902 and 7904 Series.
3. Two-Part, Foamed-In-Place, Silicone Sealant: Dow Corning Corp. Fire Stop Foam, General Electric Co. Pensil 851.
4. Fire Stop Devices: See Section 26 05 33, Raceway and Boxes, for raceway and cable fittings.

2.15 ENCLOSURES

- A. Finish: Sheet metal structural and enclosure parts shall be completely painted using an electrodeposition process so interior and exterior surfaces as well as bolted structural joints have a complete finish coat on and between them.
- B. Color: Manufacturer’s standard color (gray) baked-on enamel, unless otherwise shown.
- C. Barriers: Provide metal barriers within enclosures to separate wiring of different systems and voltage.
- D. Enclosure Selections:
 1. Except as shown otherwise, provide electrical enclosures according to the following table:

Enclosures			
Location	Finish	Environment	NEMA 250 Type
Outdoor	Any	Wet	4
Outdoor	Any	Denoted “WP”	3R
Outdoor	Any	Wet and Corrosive	4X 316 Stainless Steel
Outdoor	Any	Wet, Dust or Oil	13
Outdoor	Any	Hazardous Gas	7
Outdoor	Any	Hazardous Dust	9

PART 3 EXECUTION

3.01 GENERAL

- A. Install equipment in accordance with manufacturer's recommendations.

3.02 PUSHBUTTON, INDICATING LIGHT, AND SELECTOR SWITCH

- A. Install heavy-duty, oil-tight type in nonhazardous, indoor, dry locations, including motor control centers, control panels, and individual stations, unless otherwise shown.
- B. Install heavy-duty, watertight and corrosion-resistant type in nonhazardous, outdoor, or normally wet areas, unless otherwise shown.

3.03 SUPPORT AND FRAMING CHANNEL

- A. Install where required for mounting and supporting electrical equipment, raceway, and cable tray systems.
- B. Channel Type:
 - 1. Interior, Wet or Dry (Noncorrosive) Locations:
 - a. Aluminum Raceway: Extruded aluminum or carbon steel with neoprene material isolators.
 - b. PVC-Coated Conduit: PVC coated.
 - c. Steel Raceway and Other Systems Not Covered: Carbon steel or paint coated.
 - 2. Interior, Corrosive (Wet or Dry) Locations:
 - a. Aluminum Raceway: Extruded aluminum.
 - b. PVC Conduit: Type 316 stainless steel or nonmetallic.
 - c. PVC-Coated Steel Conduit and Other Systems Not Covered: Type 316 stainless steel, nonmetallic, or PVC-coated steel.
 - 3. Outdoor, Noncorrosive Locations:
 - a. Steel Raceway: Carbon steel or paint coated framing channel, except where mounted on aluminum handrail, then use aluminum framing channel.
 - b. Aluminum Raceway and Other Systems Not Covered: Aluminum framing channel or carbon steel with neoprene material isolators.

4. Outdoor Corrosive Locations:
 - a. PVC Conduit: Type 316 stainless steel or nonmetallic.
 - b. Aluminum Raceway: Aluminum or carbon steel with neoprene material isolators.
 - c. PVC-Coated Steel Conduit and Other Systems Not Covered: Type 316 stainless steel, nonmetallic, or PVC-coated steel.
5. Aluminum Railings: Devices mounted on aluminum railing shall use aluminum framing channel.

C. Paint cut ends prior to installation with the following:

1. Carbon Steel Channel: Zinc-rich primer.
2. Painted Channel: Rust-inhibiting epoxy or acrylic paint.
3. Nonmetallic Channel: Epoxy resin sealer.
4. PVC-Coated Channel: PVC patch.

3.04 INTRINSIC SAFETY BARRIERS

- A. Install in compliance with ISA RP12.06.01.
- B. Arrange conductors such that wiring from hazardous areas cannot short to wiring from nonhazardous area.
- C. Stencil “INTRINSICALLY SAFE CIRCUIT” on all boxes enclosing barriers.

3.05 FIRESTOPS

- A. Install in strict conformance with manufacturer’s instructions. Comply with installation requirements established by testing and inspecting agency.
- B. Sealant: Install sealant including forming, packing, and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide firestops with fire-resistance ratings indicated for floor or wall assembly in which penetration occurs.

END OF SECTION

**SECTION 26 05 05
CONDUCTORS**

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. Association of Edison Illuminating Companies (AEIC): CS 8, Specification for Extruded Dielectric Shielded Power Cables Rated 5 kV through 46 kV.
 2. ASTM International (ASTM):
 - a. A167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - b. B3, Standard Specification for Soft or Annealed Copper Wire.
 - c. B8, Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
 - d. B496, Standard Specification for Compact Round Concentric-Lay-Stranded Copper Conductors.
 3. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. 48, Standard Test Procedures and Requirements for Alternating-Current Cable Terminations Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV Through 500 kV.
 - b. 386, Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600V.
 - c. 404, Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2500 V to 500000 V.
 4. Insulated Cable Engineer's Association, Inc. (ICEA):
 - a. S-58-679, Standard for Control Cable Conductor Identification.
 - b. S-73-532, Standard for Control Thermocouple Extensions and Instrumentation Cables.
 - c. T-29-520, Conducting Vertical Cable Tray Flame Tests with Theoretical Heat Input of 210,000 Btu/hour.
 5. National Electrical Manufacturers' Association (NEMA):
 - a. CC 1, Electric Power Connectors for Substations.
 - b. WC 57, Standard for Control, Thermocouple Extension, and Instrumentation Cables.
 - c. WC 70, Standard for Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.

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- d. WC 71, Standard for Nonshielded Cables Rated 2001-5000 Volts for Use in the Distribution of Electric Energy.
- e. WC 74, 5-46 kV Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy.
- 6. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
 - b. 262, Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- 7. Telecommunications Industry Association (TIA): TIA-568-C, Commercial Building Telecommunications Cabling Standard.
- 8. Underwriters Laboratories Inc. (UL):
 - a. 13, Standard for Safety for Power-Limited Circuit Cables.
 - b. 44, Standard for Safety for Thermoset-Insulated Wires and Cables.
 - c. 62, Standard for Safety for Flexible Cord and Cables.
 - d. 486A-486B, Standard for Safety for Wire Connectors.
 - e. 486C, Standard for Safety for Splicing Wire Connectors.
 - f. 510, Standard for Safety for Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape.
 - g. 854, Standard for Safety for Service-Entrance Cables.
 - h. 1072, Standard for Safety for Medium-Voltage Power Cables.
 - i. 1277, Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.
 - j. 1569, Standard for Safety for Metal-Clad Cables.
 - k. 1581, Standard for Safety for Reference Standard for Electrical Wires, Cables, and Flexible Cords.

1.02 QUALITY ASSURANCE

A. Authority Having Jurisdiction (AHJ):

- 1. Provide the Work in accordance with NFPA 70. Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.
- 2. Materials and equipment manufactured within the scope of standards published by Underwriters Laboratories Inc. shall conform to those standards and shall have an applied UL listing mark.

PART 2 PRODUCTS

2.01 CONDUCTORS 600 VOLTS AND BELOW

- A. Conform to applicable requirements of NEMA WC 70.

- B. Conductor Type:
 - 1. 120-Volt and 277-Volt Lighting, 10 AWG and Smaller: Solid copper.
 - 2. 120-Volt Receptacle Circuits, 10 AWG and Smaller: Solid copper.
 - 3. All Other Circuits: Stranded copper.
- C. Insulation: Type THHN/THWN-2, except for sizes No. 6 and larger, with XHHW-2 insulation.
- D. Direct Burial and Aerial Conductors and Cables:
 - 1. Type USE/RHH/RHW insulation, UL 854 listed, or Type RHW-2/USE-2.
 - 2. Conform to physical and minimum thickness requirements of NEMA WC 70.
- E. Flexible Cords and Cables:
 - 1. Type SOW-A/50 with ethylene propylene rubber insulation in accordance with UL 62.
 - 2. Conform to physical and minimum thickness requirements of NEMA WC 70.

2.02 600-VOLT RATED CABLE

- A. General:
 - 1. Type TC, meeting requirements of UL 1277, including Vertical Tray Flame Test at 70,000 Btu per hour, and NFPA 70, Article 340, or UL 13 meeting requirements of NFPA 70, Article 725.
 - 2. Permanently and legibly marked with manufacturer's name, maximum working voltage for which cable was tested, type of cable, and UL listing mark.
 - 3. Suitable for installation in open air, in cable trays, or conduit.
 - 4. Minimum Temperature Rating: 90 degrees C dry locations, 75 degrees C wet locations.
 - 5. Overall Outer Jacket: PVC, flame-retardant, sunlight- and oil-resistant.
- B. Type 1, Multiconductor Control Cable:
 - 1. Conductors:
 - a. 14 AWG, seven-strand copper.
 - b. Insulation: 15-mil PVC with 4-mil nylon.
 - c. UL 1581 listed as Type THHN/THWN rated VW-1.
 - d. Conductor group bound with spiral wrap of barrier tape.
 - e. Color Code: In accordance with ICEA S-58-679, Method 1, Table 2.

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2. Cable: Passes the ICEA T-29-520, 210,000 Btu per hour Vertical Tray Flame Test.
3. Cable Sizes:

No. of Conductors	Max. Outside Diameter (Inches)	Jacket Thickness (Mils)
3	0.41	45
5	0.48	45
7	0.52	45
12	0.72	60
19	0.83	60
25	1.00	60
37	1.15	80

4. Manufacturers:
 - a. Okonite Co.
 - b. Southwire.

C. Type 2, Multiconductor Power Cable:

1. General:
 - a. Meet or exceed UL 1581 for cable tray use.
 - b. Meet or exceed UL 1277 for direct burial and sunlight-resistance.
 - c. Overall Jacket: PVC.
2. Conductors:
 - a. Class B stranded, coated copper.
 - b. Insulation: Chemically cross-linked ethylene-propylene or cross-linked polyethylene.
 - c. UL rated VW-1 or listed Type XHHW-2.
 - d. Color Code:
 - 1) Conductors, size 8 AWG and smaller, colored conductors, ICEA S-58-679, Method 1, Table 1.
 - 2) Conductors, size 6 AWG and larger, ICEA S-73-532, Method 4.
3. Cable shall pass ICEA T-29-520, 210,000 Btu per hour Vertical Tray Flame Test.

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4. Cable Sizes:

Conductor Size	Minimum Ground Wire Size	No. of Current Carrying Conductors	Max. Outside Diameter (Inches)	Nominal Jacket Thickness (Mils)
12	12	2	0.42	45
		3	0.45	
		4	0.49	
10	10	2	0.54	60
		3	0.58	
		4	0.63	
8	10	3	0.66	60
		4	0.75	
6	8	3	0.74	60
		4	0.88	
4	6	3	0.88	60
		4	1.04	
2	6	3	1.01	80
		4	1.16	
1	6	3	1.10	80
		4	1.25	
1/0	6	3	1.22	80
		4	1.35	
2/0	4	3	1.32	80
		4	1.53	
3/0	4	3	1.40	80
		4	1.60	
4/0	4	3	1.56	80
		4	1.78	

5. Manufacturers:

- a. Okonite Co.
- b. Southwire.

D. Type 3, 16 AWG, Twisted, Shielded Pair, Instrumentation Cable: Single pair, designed for noise rejection for process control, computer, or data log applications meeting NEMA WC 57 requirements.

1. Outer Jacket: 45-mil nominal thickness.
2. Individual Pair Shield: 1.35-mil, double-faced aluminum/synthetic polymer overlapped to provide 100 percent coverage.
3. Dimension: 0.31-inch nominal OD.

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4. Conductors:
 - a. Bare soft annealed copper, Class B, seven-strand concentric, meeting requirements of ASTM B8.
 - b. 20 AWG, seven-strand tinned copper drain wire.
 - c. Insulation: 15-mil nominal PVC.
 - d. Jacket: 4-mil nominal nylon.
 - e. Color Code: Pair conductors, black and red.
5. Manufacturers:
 - a. Okonite Co.
 - b. Alpha Wire Corp.
 - c. Belden.

2.03 GROUNDING CONDUCTORS

- A. Equipment: Stranded copper with green, Type USE/RHH/RHW-XLPE or THHN/THWN, insulation.
- B. Direct Buried: Bare stranded copper.

2.04 ACCESSORIES FOR CONDUCTORS 600 VOLTS AND BELOW

- A. Tape:
 1. General Purpose, Flame Retardant: 7-mil, vinyl plastic, Scotch Brand 33+, rated for 90 degrees C minimum, meeting requirements of UL 510.
 2. Flame Retardant, Cold and Weather Resistant: 8.5-mil, vinyl plastic, Scotch Brand 88.
 3. Arc and Fireproofing:
 - a. 30-mil, elastomer.
 - b. Manufacturers and Products:
 - 1) 3M; Scotch Brand 77, with Scotch Brand 69 glass cloth tapebinder.
 - 2) Plymouth; 53 Plyarc, with 77 Plyglas glass cloth tapebinder.
- B. Identification Devices:
 1. Sleeve:
 - a. Permanent, PVC, yellow or white, with legible machine-printed black markings.
 - b. Manufacturers and Products:
 - 1) Raychem; Type D-SCE or ZH-SCE.
 - 2) Brady, Type 3PS.
 2. Heat Bond Marker:
 - a. Transparent thermoplastic heat bonding film with acrylic pressure sensitive adhesive.
 - b. Self-laminating protective shield over text.

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- c. Machine printed black text.
- d. Manufacturer and Product: 3M Co.; Type SCS-HB.
3. Marker Plate: Nylon, with legible designations permanently hot stamped on plate.
4. Tie-On Cable Marker Tags:
 - a. Chemical-resistant white tag.
 - b. Size: 1/2 inch by 2 inches.
 - c. Manufacturer and Product: Raychem; Type CM-SCE.
5. Grounding Conductor: Permanent green heat-shrink sleeve, 2-inch minimum.

C. Connectors and Terminations:

1. Nylon, Self-Insulated Crimp Connectors:
 - a. Manufacturers and Products:
 - 1) Thomas & Betts; Sta-Kon.
 - 2) Burndy; Insulug.
 - 3) ILSCO.
2. Nylon, Self-Insulated, Crimp Locking-Fork, Torque-Type Terminator:
 - a. Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.
 - b. Seamless.
 - c. Manufacturers and Products:
 - 1) Thomas & Betts; Sta-Kon.
 - 2) Burndy; Insulink.
 - 3) ILSCO; ILSCONS.
3. Self-Insulated, Freespring Wire Connector (Wire Nuts):
 - a. UL 486C.
 - b. Plated steel, square wire springs.
 - c. Manufacturers and Products:
 - 1) Thomas & Betts.
 - 2) Ideal; Twister.
4. Self-Insulated, Set Screw Wire Connector:
 - a. Two piece compression type with set screw in brass barrel.
 - b. Insulated by insulator cap screwed over brass barrel.
 - c. Manufacturers:
 - 1) 3M Co.
 - 2) Thomas & Betts.
 - 3) Marrette.

D. Cable Lugs:

1. In accordance with NEMA CC 1.
2. Rated 600 volts of same material as conductor metal.

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3. Uninsulated Crimp Connectors and Terminators:
 - a. Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.
 - b. Manufacturers and Products:
 - 1) Thomas & Betts; Color-Keyed.
 - 2) Burndy; Hydent.
 - 3) ILSCO.
 4. Uninsulated, Bolted, Two-Way Connectors and Terminators:
 - a. Manufacturers and Products:
 - 1) Thomas & Betts; Locktite.
 - 2) Burndy; Quiklug.
 - 3) ILSCO.
- E. Cable Ties:
1. Nylon, adjustable, self-locking, and reusable.
 2. Manufacturer and Product: Thomas & Betts; TY-RAP.
- F. Heat Shrinkable Insulation:
1. Thermally stabilized cross-linked polyolefin.
 2. Single wall for insulation and strain relief.
 3. Dual Wall, adhesive sealant lined, for sealing and corrosion resistance.
 4. Manufacturers and Products:
 - a. Thomas & Betts; SHRINK-KON.
 - b. Raychem; RNF-100 and ES-2000.

2.05 PULLING COMPOUND

- A. Nontoxic, noncorrosive, noncombustible, nonflammable, water-based lubricant; UL listed.
- B. Suitable for rubber, neoprene, PVC, polyethylene, hypalon, CPE, and lead-covered wire and cable.
- C. Approved for intended use by cable manufacturer.
- D. Suitable for zinc-coated steel, aluminum, PVC, bituminized fiber, and fiberglass raceways.
- E. Manufacturers:
 1. Ideal Co.
 2. Polywater, Inc.
 3. Cable Grip Co.

2.06 WARNING TAPE

- A. As specified in Section 26 05 33, Raceway and Boxes.

2.07 SOURCE QUALITY CONTROL

- A. Conductors 600 Volts and Below: Test in accordance with UL 44 and UL 854.

PART 3 EXECUTION

3.01 GENERAL

- A. Conductor installation shall be in accordance with manufacturer's recommendations.
- B. Conductor and cable sizing shown is based on copper conductors, unless noted otherwise.
- C. Do not exceed cable manufacturer's recommendations for maximum pulling tensions and minimum bending radii.
- D. Terminate conductors and cables, unless otherwise indicated.
- E. Tighten screws and terminal bolts in accordance with UL 486A-486B for copper conductors and aluminum conductors.
- F. Cable Lugs: Provide with correct number of holes, bolt size, and center-to-center spacing as required by equipment terminals.
- G. Bundling: Where single conductors and cables in manholes, handholes, vaults, cable trays, and other indicated locations are not wrapped together by some other means, bundle conductors from each conduit throughout their exposed length with cable ties placed at intervals not exceeding 12 inches on center.
- H. Ream, remove burrs, and clear interior of installed conduit before pulling wires or cables.

3.02 POWER CONDUCTOR COLOR CODING

- A. Conductors 600 Volts and Below:
 - 1. 6 AWG and Larger: Apply general purpose, flame retardant tape at each end, and at accessible locations wrapped at least six full overlapping turns, covering area 1-1/2 inches to 2 inches wide.
 - 2. 8 AWG and Smaller: Provide colored conductors.

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3. Colors:

System	Conductor	Color
All Systems	Equipment Grounding	Green
240/120 Volts, Single-Phase, Three-Wire	Grounded Neutral One Hot Leg Other Hot Leg	White Black Red
208Y/120 Volts, Three-Phase, Four-Wire	Grounded Neutral Phase A Phase B Phase C	White Black Red Blue
240/120 Volts, Three-Phase, Four-Wire, Delta, Center Tap, Ground on Single-Phase	Grounded Neutral Phase A High (wild) Leg Phase C	White Black Orange Blue
480Y/277 Volts, Three-Phase, Four-Wire	Grounded Neutral Phase A Phase B Phase C	White Brown Orange Yellow
Note: Phase A, B, C implies direction of positive phase rotation.		

4. Tracer: Outer covering of white with identifiable colored strip, other than green, in accordance with NFPA 70.

3.03 CIRCUIT IDENTIFICATION

- A. Identify power, instrumentation, and control conductor circuits at each termination, and in accessible locations such as manholes, handholes, panels, switchboards, motor control centers, pull boxes, and terminal boxes.
- B. Circuits Appearing in Circuit Schedules: Identify using circuit schedule designations.
- C. Circuits Not Appearing in Circuit Schedules:
 - 1. Assign circuit name based on device or equipment at load end of circuit.
 - 2. Where this would result in same name being assigned to more than one circuit, add number or letter to each otherwise identical circuit name to make it unique.

D. Method:

1. Conductors 3 AWG and Smaller: Identify with sleeves or heat bond markers.
2. Cables and Conductors 2 AWG and Larger:
 - a. Identify with marker plates or tie-on cable marker tags.
 - b. Attach with nylon tie cord.
3. Taped-on markers or tags relying on adhesives not permitted.

3.04 CONDUCTORS 600 VOLTS AND BELOW

- A. Install 10 AWG or 12 AWG conductors for branch circuit power wiring in lighting and receptacle circuits.
- B. Do not splice incoming service conductors and branch power distribution conductors 6 AWG and larger, unless specifically indicated or approved by Engineer.
- C. Connections and Terminations:
 1. Install wire nuts only on solid conductors. Wire nuts are not allowed on stranded conductors.
 2. Install nylon self-insulated crimp connectors and terminators for instrumentation and control, circuit conductors.
 3. Install self-insulated, set screw wire connectors for two-way connection of power circuit conductors 12 AWG and smaller.
 4. Install uninsulated crimp connectors and terminators for instrumentation, control, and power circuit conductors 4 AWG through 2/0 AWG.
 5. Install uninsulated, bolted, two-way connectors and terminators for power circuit conductors 3/0 AWG and larger.
 6. Install uninsulated terminators bolted together on motor circuit conductors 10 AWG and larger.
 7. Place no more than one conductor in any single-barrel pressure connection.
 8. Install crimp connectors with tools approved by connector manufacturer.
 9. Install terminals and connectors acceptable for type of material used.
 10. Compression Lugs:
 - a. Attach with a tool specifically designed for purpose. Tool shall provide complete, controlled crimp and shall not release until crimp is complete.
 - b. Do not use plier type crimpers.

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- D. Do not use soldered mechanical joints.
- E. Splices and Terminations:
 - 1. Insulate uninsulated connections.
 - 2. Indoors: Use general purpose, flame retardant tape or single wall heat shrink.
 - 3. Outdoors, Dry Locations: Use flame retardant, cold- and weather-resistant tape or single wall heat shrink.
 - 4. Below Grade and Wet or Damp Locations: Use dual wall heat shrink.
- F. Cap spare conductors with UL listed end caps.
- G. Cabinets, Panels, and Motor Control Centers:
 - 1. Remove surplus wire, bridle and secure.
 - 2. Where conductors pass through openings or over edges in sheet metal, remove burrs, chamfer edges, and install bushings and protective strips of insulating material to protect the conductors.
- H. Control and Instrumentation Wiring:
 - 1. Where terminals provided will accept such lugs, terminate control and instrumentation wiring, except solid thermocouple leads, with insulated, locking-fork compression lugs.
 - 2. Terminate with methods consistent with terminals provided, and in accordance with terminal manufacturer's instructions.
 - 3. Locate splices in readily accessible cabinets or junction boxes using terminal strips.
 - 4. Where connections of cables installed under this section are to be made under Section 40 90 01, Instrumentation and Control for Process Systems, leave pigtails of adequate length for bundled connections.
 - 5. Cable Protection:
 - a. Under Infinite Access Floors: May install without bundling.
 - b. All Other Areas: Install individual wires, pairs, or triads in flex conduit under floor or grouped into bundles at least 1/2 inch in diameter.
 - c. Maintain integrity of shielding of instrumentation cables.
 - d. Ensure grounds do not occur because of damage to jacket over shield.
- I. Extra Conductor Length: For conductors to be connected by others, install minimum 6 feet of extra conductor in freestanding panels and minimum 2 feet in other assemblies.

3.05 UNDERGROUND DIRECT BURIAL CABLE

- A. Install in trench as specified in Section 31 23 23.15, Trench Backfill.
- B. Warning Tape: Install approximately 6 inches above cable, aligned parallel to, and within 12 inches of centerline of the run.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. Institute of Electrical and Electronics Engineers (IEEE): C2, National Electrical Safety Code (NESC).
 2. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).

1.02 QUALITY ASSURANCE

- A. Authority Having Jurisdiction (AHJ):
1. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, provide material and equipment labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ to provide a basis for approval under NEC.
 2. Materials and equipment manufactured within the scope of standards published by UL:
 - a. Confirm conformance with UL standards.
 - b. Supply with an applied UL listing mark.

PART 2 PRODUCTS

2.01 GROUND ROD

- A. Material: Copper-clad.
- B. Diameter: Minimum 3/4 inch.
- C. Length: 20 feet.

2.02 GROUND CONDUCTORS

- A. As specified in Section 26 05 05, Conductors.

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2.03 CONNECTORS

A. Exothermic Weld Type:

1. Outdoor Weld: Suitable for exposure to elements or direct burial.
2. Indoor Weld: Use low-smoke, low-emission process.
3. Manufacturers:
 - a. Erico Products, Inc.; Cadweld and Cadweld Exolon.
 - b. Thermoweld.

B. Compression Type:

1. Compress-deforming type; wrought copper extrusion material.
2. Single indentation for conductors 6 AWG and smaller.
3. Double indentation with extended barrel for conductors 4 AWG and larger.
4. Barrels prefilled with oxide-inhibiting and antiseizing compound and sealed.
5. Manufacturers:
 - a. Burndy Corp.; Hyground Irreversible Compression.
 - b. Thomas and Betts Co.
 - c. ILSCO.

C. Mechanical Type: Split-bolt, saddle, or cone screw type; copper alloy material.

1. Manufacturers:
 - a. Burndy Corp.
 - b. Thomas and Betts Co.

2.04 GROUNDING WELLS

A. Ground rod box complete with cast-iron riser ring and traffic cover marked "GROUND ROD".

B. Manufacturers and Products:

1. Christy Co.; No. G5.
2. Lightning and Grounding Systems, Inc.; I-R Series.

PART 3 EXECUTION

3.01 GENERAL

- A. Grounding: In compliance with NFPA 70 and IEEE C2.
- B. Ground electrical service neutral at service entrance equipment with grounding electrode conductor to grounding electrode system.
- C. Ground each separately derived system neutral with common grounding electrode conductor to grounding electrode system.
- D. Bond together all grounding electrodes that are present at each building or structure served to form one common grounding electrode system.
- E. Bond together system neutrals, service equipment enclosures, exposed noncurrent-carrying metal parts of electrical equipment, metal raceways, ground conductor in raceways and cables, receptacle ground connections, and metal piping systems.
- F. Shielded Power Cables: Ground shields at each splice or termination in accordance with recommendations of splice or termination manufacturer.
- G. Shielded Instrumentation Cables:
 - 1. Ground shield to ground bus at power supply for analog signal.
 - 2. Expose shield minimum 1 inch at termination to field instrument and apply heat shrink tube.
 - 3. Do not ground instrumentation cable shield at more than one point.

3.02 WIRE CONNECTIONS

- A. Ground Conductors: Install in conduit containing power conductors and control circuits above 50 volts.
- B. Nonmetallic Raceways and Flexible Tubing: Install equipment grounding conductor connected at both ends to noncurrent-carrying grounding bus.
- C. Connect ground conductors to raceway grounding bushings.
- D. Extend and connect ground conductors to ground bus in all equipment containing a ground bus.
- E. Connect enclosure of equipment containing ground bus to that bus.
- F. Bolt connections to equipment ground bus.

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- G. Bond grounding conductors to metallic enclosures at each end, and to intermediate metallic enclosures.
- H. Junction Boxes: Furnish materials and connect to equipment grounding system with grounding clips mounted directly on box, or with 3/8-inch machine screws.
- I. Metallic Equipment Enclosures: Use furnished ground lug; if none furnished, tap equipment housing and install solderless terminal connected to box with machine screw. For circuits greater than 20 amps use minimum 5/16-inch diameter bolt.

3.03 MOTOR GROUNDING

- A. Extend equipment ground bus via grounding conductor installed in motor feeder raceway; connect to motor frame.
- B. Nonmetallic Raceways and Flexible Tubing: Install an equipment grounding conductor connected at both ends to noncurrent-carrying grounding bus.
- C. Motors Less than 10 hp: Use furnished ground lug in motor connection box. If none furnished, provide compression, spade-type terminal connected to conduit box mounting screw.
- D. Motors 10 hp and Above: Use furnished ground lug in motor connection box. If none furnished, tap motor frame or equipment housing; furnish compression, one-hole, lug type terminal connected with minimum 5/16-inch brass threaded stud with bolt and washer.
- E. Circuits 20 Amps or Above: Tap motor frame or equipment housing. Install solderless terminal with minimum 5/16-inch diameter bolt.

3.04 GROUND RODS

- A. Install full length with conductor connection at upper end.
- B. Install with connection point below finished grade, unless otherwise shown.
- C. Space multiple ground rods by one rod length.
- D. Install to 8 feet below local frost depth.

3.05 GROUNDING WELLS

- A. Install for ground rods located inside buildings, asphalt and paved areas, and where shown on Drawings.
- B. Install riser ring and cover flush with surface.
- C. Place 9 inches of crushed rock in bottom of each well.

3.06 CONNECTIONS

A. General:

- 1. Abovegrade Connections: Install exothermic weld, mechanical, or compression-type connectors; or brazing.
- 2. Belowgrade Connections: Install exothermic weld or compression type connectors.
- 3. Remove paint, dirt, or other surface coverings at connection points to allow good metal-to-metal contact.
- 4. Notify Engineer prior to backfilling ground connections.

B. Exothermic Weld Type:

- 1. Wire brush or file contact point to bare metal surface.
- 2. Use welding cartridges and molds in accordance with manufacturer's recommendations.
- 3. Avoid using badly worn molds.
- 4. Mold to be completely filled with metal when making welds.
- 5. After completed welds have cooled, brush slag from weld area and thoroughly clean joint.

C. Compression Type:

- 1. Install in accordance with connector manufacturer's recommendations.
- 2. Install connectors of proper size for grounding conductors and ground rods specified.
- 3. Install using connector manufacturer's compression tool having proper sized dies and operate per manufacturer's instructions.

D. Mechanical Type:

- 1. Apply homogeneous blend of colloidal copper and rust and corrosion inhibitor before making connection.
- 2. Install in accordance with connector manufacturer's recommendations.
- 3. Do not conceal mechanical connections.

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3.07 METAL STRUCTURE GROUNDING

- A. Bond metal sheathing and exposed metal vertical structural elements to grounding system.
- B. Bond electrical equipment supported by metal platforms to the platforms.
- C. Provide electrical contact between metal frames and railings supporting pushbutton stations, receptacles, and instrument cabinets, and raceways carrying circuits to these devices.

3.08 MANHOLE AND HANDHOLE GROUNDING

- A. Install one ground rod inside each manhole and handhole larger than 24-inch by 24-inch inside dimensions.
- B. Ground Rod Floor Protrusion: 4 inches to 6 inches above floor.
- C. Make connections of grounding conductors fully visible and accessible.
- D. Connect to all non-current carrying metal parts and any metallic raceway grounding bushings to ground rod with 6 AWG copper conductor.

3.09 TRANSFORMER GROUNDING

- A. Bond neutrals of transformers within buildings to system ground network and to any additional indicated grounding electrodes.
- B. Bond neutrals of substation transformers to substation grounding grid and system grounding network.
- C. Bond neutrals of pad-mounted transformers to four locally driven ground rods and buried ground wire encircling transformer and system ground network.
- D. Bond neutral of mini-power zones to a locally driven ground rod.

3.10 LIGHTNING PROTECTION SYSTEMS

- A. Bond lightning protection system ground terminals to building or structure grounding electrode system.

3.11 SURGE PROTECTION EQUIPMENT GROUNDING

- A. Connect surge arrestor ground terminals to equipment ground bus.

END OF SECTION

SECTION 26 05 33
RACEWAY AND BOXES

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of State Highway and Transportation Officials (AASHTO): HB, Standard Specifications for Highway Bridges.
 2. ASTM International (ASTM):
 - a. A123/123M, Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
 - b. A167, Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - c. A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - d. C857, Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
 - e. D149, Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies.
 3. Telecommunications Industry Association (TIA): 569B, Commercial Building Standard for Telecommunications Pathways and Spaces.
 4. National Electrical Contractor's Association, Inc. (NECA): Installation standards.
 5. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - b. C80.1, Electrical Rigid Steel Conduit (ERSC).
 - c. C80.3, Steel Electrical Metallic Tubing (EMT).
 - d. C80.5, Electrical Rigid Aluminum Conduit (ERAC).
 - e. C80.6, Electrical Intermediate Metal Conduit (EIMC).
 - f. RN 1, Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - g. TC 2, Electrical Polyvinyl Chloride (PVC) Conduit.
 - h. TC 3, Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.

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- i. TC 6, Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installation.
 - j. TC 14, Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.
 - k. VE 1, Metallic Cable Tray Systems.
6. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).
7. Underwriters Laboratories Inc. (UL):
- a. 1, Standard for Safety for Flexible Metal Conduit.
 - b. 5, Standard for Safety for Surface Metal Raceways and Fittings.
 - c. 6, Standard for Safety for Electrical Rigid Metal Conduit – Steel.
 - d. 6A, Standard for Safety for Electrical Rigid Metal Conduit – Aluminum, Red Brass and Stainless.
 - e. 360, Standard for Safety for Liquid-Tight Flexible Steel Conduit.
 - f. 514B, Standard for Safety for Conduit, Tubing, and Cable Fittings.
 - g. 651, Standard for Safety for Schedule 40 and 80 Rigid PVC Conduit and Fittings.
 - h. 651A, Standard for Safety for Type EB and A Rigid PVC Conduit and HDPE Conduit.
 - i. 797, Standard for Safety for Electrical Metallic Tubing – Steel.
 - j. 870, Standard for Safety for Wireways, Auxiliary Gutters, and Associated Fittings.
 - k. 1242, Standard for Safety for Electrical Intermediate Metal Conduit – Steel.
 - l. 1660, Standard for Safety for Liquid-Tight Flexible Nonmetallic Conduit.
 - m. 1684, Standard for Safety for Reinforced Thermosetting Resin Conduit (RTRC) and Fittings.
 - n. 2024, Standard for Safety for Optical Fiber and Communication Cable Raceway.

1.02 QUALITY ASSURANCE

A. Authority Having Jurisdiction (AHJ):

- 1. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.
- 2. Materials and equipment manufactured within scope of standards published by Underwriters Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.

- B. PVC-Coated, Rigid Galvanized Steel Conduit Installer: Certified by conduit manufacturer as having received minimum 2 hours of training on installation procedures.

PART 2 PRODUCTS

2.01 CONDUIT AND TUBING

- A. Rigid Galvanized Steel Conduit (RGS):
 - 1. Meet requirements of NEMA C80.1 and UL 6.
 - 2. Material: Hot-dip galvanized with chromated protective layer.
- B. Rigid Aluminum Conduit:
 - 1. Meet requirements of NEMA C80.5 and UL 6A.
 - 2. Material: Type 6063, copper-free aluminum alloy.
- C. PVC Schedule 40 Conduit:
 - 1. Meet requirements of NEMA TC 2 and UL 651.
 - 2. UL listed for concrete encasement, underground direct burial, concealed or direct sunlight exposure, and 90 degrees C insulated conductors.
- D. PVC-Coated Rigid Galvanized Steel Conduit:
 - 1. Meet requirements of NEMA RN 1.
 - 2. Material:
 - a. Meet requirements of NEMA C80.1 and UL 6.
 - b. Exterior Finish: PVC coating, 40-mil nominal thickness; bond to metal shall have tensile strength greater than PVC.
 - c. Interior finish: Urethane coating, 2-mil nominal thickness.
 - 3. Threads: Hot-dipped galvanized and factory coated with urethane.
 - 4. Bendable without damage to interior or exterior coating.
- E. Flexible Metal, Liquid-Tight Conduit:
 - 1. UL 360 listed for 105 degrees C insulated conductors.
 - 2. Material: Galvanized steel with extruded PVC jacket.
- F. Flexible Metal, Nonliquid-Tight Conduit:
 - 1. Meet requirements of UL 1.
 - 2. Material: Galvanized steel.

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2.02 FITTINGS

A. Rigid Galvanized Steel Conduit:

1. General:
 - a. Meet requirements of UL 514B.
 - b. Type: Threaded, galvanized. Set screw and threadless compression fittings not permitted.
2. Bushing:
 - a. Material: Malleable iron with integral insulated throat, rated for 150 degrees C.
 - b. Manufacturers and Products:
 - 1) Appleton; Series BU-I.
 - 2) O-Z/Gedney; Type HB.
3. Grounding Bushing:
 - a. Material: Malleable iron with integral insulated throat rated for 150 degrees C, with solderless lugs.
 - b. Manufacturers and Products:
 - 1) Appleton; Series GIB.
 - 2) O-Z/Gedney; Type HBLG.
4. Conduit Hub:
 - a. Material: Malleable iron with insulated throat with bonding screw.
 - b. UL listed for use in wet locations.
 - c. Manufacturers and Products:
 - 1) Appleton, Series HUB-B.
 - 2) O-Z/Gedney; Series CH.
 - 3) Meyers; ST Series.
5. Conduit Bodies:
 - a. Sized as required by NFPA 70.
 - b. Manufacturers and Products (For Normal Conditions):
 - 1) Appleton; Form 35 threaded unilets.
 - 2) Crouse-Hinds; Form 7 or Form 8 threaded condulets.
 - 3) Killark; Series O electrolets.
 - 4) Thomas & Betts; Form 7 or Form 8.
 - c. Manufacturers (For Hazardous Locations):
 - 1) Appleton.
 - 2) Crouse-Hinds.
 - 3) Killark.
6. Couplings: As supplied by conduit manufacturer.
7. Unions:
 - a. Concrete tight, hot-dip galvanized malleable iron.
 - b. Manufacturers and Products:
 - 1) Appleton; Series SCC bolt-on coupling or Series EC three-piece union.

- 2) O-Z/Gedney; Type SSP split coupling or Type 4 Series, three-piece coupling.
 8. Conduit Sealing Fitting:
 - a. Manufacturers and Products:
 - 1) Appleton; Type EYF, EYM, or ESU.
 - 2) Crouse-Hinds; Type EYS or EZS.
 - 3) Killark; Type EY or Type EYS.
 9. Drain Seal:
 - a. Manufacturers and Products:
 - 1) Appleton; Type EYD.
 - 2) Crouse-Hinds; Type EYD or Type EZD.
 10. Drain/Breather Fitting:
 - a. Manufacturers and Products:
 - 1) Appleton; Type ECDB.
 - 2) Crouse-Hinds; ECD.
 11. Expansion Fitting:
 - a. Manufacturers and Products:
 - 1) Deflection/Expansion Movement:
 - a) Appleton; Type DF.
 - b) Crouse-Hinds; Type XD.
 - 2) Expansion Movement Only:
 - a) Appleton; Type XJ.
 - b) Crouse-Hinds; Type XJ.
 - c) Thomas & Betts; XJG-TP.
 12. Cable Sealing Fitting:
 - a. To form watertight nonslip cord or cable connection to conduit.
 - b. For Conductors with OD of 1/2 inch or Less: Neoprene bushing at connector entry.
 - c. Manufacturers and Products:
 - 1) Appleton; CG-S.
 - 2) Crouse-Hinds; CGBS.
- B. Rigid Aluminum Conduit:
1. General:
 - a. Meet requirements of UL 514B.
 - b. Type: Threaded, copper-free. Set screw fittings not permitted.
 2. Insulated Bushing:
 - a. Material: Cast aluminum, with integral insulated throat, rated for 150 degrees C.
 - b. Manufacturer and Product: O-Z/Gedney; Type AB.

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3. Grounding Bushing:
 - a. Material: Cast aluminum with integral insulated throat, rated for 150 degrees, with solderless lugs.
 - b. Manufacturer and Product: O-Z/Gedney; Type ABLG.
4. Conduit Hub:
 - a. Material: Cast aluminum, with insulated throat.
 - b. UL listed for use in wet locations.
 - c. Manufacturers and Products:
 - 1) O-Z/Gedney; Type CHA.
 - 2) Thomas & Betts; Series 370AL.
 - 3) Meyers; Series SA.
5. Conduit Bodies:
 - a. Manufacturers and Products (For Normal Conditions):
 - 1) Appleton; Form 85 threaded unilets.
 - 2) Crouse-Hinds; Mark 9 or Form 7-SA threaded condulets.
 - 3) Killark; Series O electrolets.
 - b. Manufacturers (For Hazardous Locations):
 - 1) Appleton.
 - 2) Crouse-Hinds.
 - 3) Killark.
6. Couplings: As supplied by conduit manufacturer.
7. Conduit Sealing Fitting:
 - a. Manufacturers and Products:
 - 1) Appleton; Type EYF-AL or EYM-AL.
 - 2) Crouse-Hinds; Type EYS-SA or EZS-SA.
 - 3) Killark; Type EY or Type EYS.
8. Drain Seal:
 - a. Manufacturers and Products:
 - 1) Appleton; Type EYDM-A.
 - 2) Crouse-Hinds; Type EYD-SA or Type EZD-SA.
9. Drain/Breather Fitting:
 - a. Manufacturers and Products:
 - 1) Appleton; Type ECDB.
 - 2) Crouse-Hinds; ECD.
10. Expansion Fitting:
 - a. Manufacturers and Products:
 - 1) Deflection/Expansion Movement: Steel City; Type DF-A.
 - 2) Expansion Movement Only: Steel City; Type AF-A.
11. Cable Sealing Fittings:
 - a. To form watertight nonslip cord or cable connection to conduit.
 - b. Bushing: Neoprene at connector entry.
 - c. Manufacturer and Product: Appleton; CG-S.

- C. PVC Conduit and Tubing:
1. Meet requirements of NEMA TC 3.
 2. Type: PVC, slip-on.
- D. PVC-Coated Rigid Galvanized Steel Conduit:
1. Meet requirements of UL 514B.
 2. Fittings: Rigid galvanized steel type, PVC coated by conduit manufacturer.
 3. Conduit Bodies: Cast metal hot-dipped galvanized or urethane finish. Cover shall be of same material as conduit body. PVC coated by conduit manufacturer.
 4. Finish: 40-mil PVC exterior, 2-mil urethane interior.
 5. Overlapping pressure-sealing sleeves.
 6. Conduit Hangers, Attachments, and Accessories: PVC-coated.
 7. Manufacturers:
 - a. Robroy Industries.
 - b. Ocal.
 8. Expansion Fitting:
 - a. Manufacturer and Product: Ocal; OCAL-BLUE XJG.
- E. Flexible Metal, Liquid-Tight Conduit:
1. Metal insulated throat connectors with integral nylon or plastic bushing rated for 105 degrees C.
 2. Insulated throat and sealing O-rings.
 3. Manufacturers and Products:
 - a. Thomas & Betts; Series 5331.
 - b. O-Z/Gedney; Series 4Q.
- F. Flexible Metal, Nonliquid-Tight Conduit:
1. Meet requirements of UL 514B.
 2. Body: Galvanized steel or malleable iron.
 3. Throat: Nylon insulated.
 4. 1-1/4-Inch Conduit and Smaller: One screw body.
 5. 1-1/2-Inch Conduit and Larger: Two screw body.
 6. Manufacturer and Product: Appleton; Series 7400.
- G. Flexible Coupling, Hazardous Locations:
1. Approved for use in atmosphere involved.
 2. Rating: Watertight and UL listed for use in Class I, Division 1 and 2 areas.
 3. Outer bronze braid and an insulating liner.

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4. Conductivity equal to a similar length of rigid metal conduit.
5. Manufacturers and Products:
 - a. Crouse-Hinds; Type ECGJH or Type ECLK.
 - b. Appleton; EXGJH or EXLK.

H. Watertight Entrance Seal Device:

1. New Construction:
 - a. Material: Oversized sleeve, malleable iron body with sealing ring, pressure ring, grommet seal, and pressure clamp.
 - b. Manufacturer and Product: O-Z/Gedney; Type FSK or Type WSK, as required.
2. Cored-Hole Application:
 - a. Material: Assembled dual pressure disks, neoprene sealing ring, and membrane clamp.
 - b. Manufacturer and Product: O-Z/Gedney; Series CSM.

2.03 OUTLET AND DEVICE BOXES

A. Sheet Steel: One-piece drawn type, zinc-plated or cadmium-plated.

B. Cast Metal:

1. Box: Malleable iron.
2. Cover: Gasketed, weatherproof, malleable iron, with stainless steel screws.
3. Hubs: Threaded.
4. Lugs: Cast Mounting.
5. Manufacturers and Products, Nonhazardous Locations:
 - a. Crouse-Hinds; Type FS or Type FD.
 - b. Appleton; Type FS or Type FD.
 - c. Killark.
6. Manufacturers and Products, Hazardous Locations:
 - a. Crouse-Hinds; Type GUA or Type EAJ.
 - b. Appleton; Type GR.

C. Cast Aluminum:

1. Material:
 - a. Box: Cast, copper-free aluminum.
 - b. Cover: Gasketed, weatherproof, cast copper-free aluminum with stainless steel screws.
2. Hubs: Threaded.
3. Lugs: Cast mounting.

4. Manufacturers and Products, Nonhazardous Locations:
 - a. Crouse-Hinds; Type FS-SA or Type FD-SA.
 - b. Appleton; Type FS or Type FD.
 - c. Killark.
5. Manufacturers and Products, Hazardous Locations:
 - a. Crouse-Hinds; Type GUA-SA.
 - b. Appleton; Type GR.

D. PVC-Coated Cast Metal:

1. Type: One-piece.
2. Material: Malleable iron, cast ferrous metal, or cast aluminum.
3. Coating:
 - a. Exterior Surfaces: 40-mil PVC.
 - b. Interior Surfaces: 2-mil urethane.
4. Manufacturers:
 - a. Robroy Industries.
 - b. Ocal.

E. Nonmetallic:

1. Box: PVC.
2. Cover: PVC, weatherproof, with stainless steel screws.
3. Manufacturer and Product: Carlon; Type FS or Type FD, with Type E98 or Type E96 covers.

2.04 JUNCTION AND PULL BOXES

- A. Outlet Box Used as Junction or Pull Box: As specified under Article Outlet and Device Boxes.
- B. Conduit Bodies Used as Junction Boxes: As specified under Article Fittings.
- C. Large Sheet Steel Box:
 1. NEMA 250, Type 1.
 2. Box: Code-gauge, galvanized steel.
 3. Cover: Full access, screw type.
 4. Machine Screws: Corrosion-resistant.

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D. Large Cast Metal Box, Hazardous Locations:

1. NEMA 250 Type 7 or Type 9 as required for Class, Division, and Group involved.
2. Box: Cast ferrous metal, electro-galvanize finished or copper-free aluminum with drilled and tapped conduit entrances.
3. Cover: Hinged with screws.
4. Hardware and Machine Screws: ASTM A167, Type 316 stainless steel.
5. Manufacturers and Products:
 - a. Crouse-Hinds; Type EJB.
 - b. Appleton; Type AJBEW.

E. Large Stainless Steel Box:

1. NEMA 250 Type 4X.
2. Box: 14-gauge, ASTM A240/A240M, Type 316 stainless steel, with white enamel painted interior mounting panel.
3. Cover: Hinged with screws.
4. Hardware and Machine Screws: ASTM A167, Type 316 stainless steel.
5. Manufacturers:
 - a. Hoffman Engineering Co.
 - b. Robroy Industries.
 - c. Wiegman.

2.05 TERMINAL JUNCTION BOX

- A. Cover: Hinged, unless otherwise shown.
- B. Interior Finish: Paint with white enamel or lacquer.
- C. Terminal Blocks:
 1. Separate connection point for each conductor entering or leaving box.
 2. Spare Terminal Points: 25 percent, minimum.

2.06 METAL WIREWAYS

- A. Meet requirements of UL 870.
- B. Type: Steel-enclosed, lay-in type.
- C. Cover: Hinged with friction latch.
- D. Rating: Outdoor raintight.

- E. Finish: Rust inhibiting phosphatizing primer and gray baked enamel.
- F. Hardware: Plated to prevent corrosion; screws installed toward the inside protected by spring nuts or otherwise guarded to prevent wire insulation damage.
- G. Knockouts: Without knockouts, unless otherwise indicated.
- H. Manufacturers:
 - 1. Circle AW.
 - 2. Hoffman.
 - 3. Square D.

2.07 ACCESSORIES

- A. Duct Bank Spacers:
 - 1. Modular Type:
 - a. Nonmetallic, interlocking, for multiple conduit sizes.
 - b. Suitable for all types of conduit.
 - c. Manufacturers:
 - 1) Underground Device, Inc.
 - 2) Carlon.
 - 2. Template Type:
 - a. Nonmetallic, custom made one-piece spacers.
 - b. Suitable for all types of conduit.
 - c. Material: HDPE or polypropylene, 1/2-inch minimum thickness.
 - d. Conduit openings cut 1 inch larger than conduit outside diameter.
 - e. Additional openings for stake-down, rebar, and concrete flow through as required.
 - f. Manufacturer and Product: SP Products; Quik Duct.
- B. Identification Devices:
 - 1. Raceway Tags:
 - a. Material: Permanent, nonferrous metal.
 - b. Shape: Round.
 - c. Raceway Designation: Pressure stamped, embossed, or engraved.
 - d. Tags relying on adhesives or taped-on markers not permitted.
 - 2. Warning Tape:
 - a. Material: Polyethylene, 4-mil gauge with detectable strip.
 - b. Color: Red.
 - c. Width: Minimum 3 inches.

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- d. Designation: Warning on tape that electric circuit is located below tape.
- e. Identifying Letters: Minimum 1-inch-high permanent black lettering imprinted continuously over entire length.
- f. Manufacturers and Products:
 - 1) Panduit; Type HTDU.
 - 2) Reef Industries; Terra Tape.
- 3. Buried Raceway Marker:
 - a. Material: Sheet bronze, consisting of double-ended arrows, straight for straight runs and bent at locations where runs change direction.
 - b. Designation: Engrave to depth of 3/32 inch; ELECTRIC CABLES, in letters 1/4-inch high.
 - c. Minimum Dimension: 1/4-inch thick, 10 inches long, and 3/4-inch wide.
- C. Raceway Coating: Clean and paint in accordance with Section 09 90 00, Painting and Coating.
- D. Heat Shrinkable Tubing:
 - 1. Material: Heat-shrinkable, cross-linked polyolefin.
 - 2. Semi-flexible with meltable adhesive inner liner.
 - 3. Color: Black.
 - 4. Manufacturers:
 - a. Raychem.
 - b. 3M.
- E. Wraparound Duct Band:
 - 1. Material: Heat-shrinkable, cross-linked polyolefin, precoated with hot-melt adhesive.
 - 2. Width: 50 mm minimum.
 - 3. Manufacturer and Product: Raychem; Type TWDB.

PART 3 EXECUTION

3.01 GENERAL

- A. Conduit and tubing sizes shown are based on use of copper conductors. Reference Section 26 05 05, Conductors, concerning conduit sizing for aluminum conductors.
- B. Comply with NECA Installation Standards.
- C. Crushed or deformed raceways not permitted.

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- D. Maintain raceway entirely free of obstructions and moisture.
- E. Immediately after installation, plug or cap raceway ends with watertight and dust-tight seals until time for pulling in conductors.
- F. Aluminum Conduit: Do not install in direct contact with concrete. Install in PVC sleeve or cored hole through concrete walls and slabs.
- G. Sealing Fittings: Provide drain seal in vertical raceways where condensate may collect above sealing fitting.
- H. Avoid moisture traps where possible. When unavoidable in exposed conduit runs, provide junction box and drain fitting at conduit low point.
- I. Group raceways installed in same area.
- J. Proximity to Heated Piping: Install raceways minimum 12 inches from parallel runs.
- K. Follow structural surface contours when installing exposed raceways. Avoid obstruction of passageways.
- L. Run exposed raceways parallel or perpendicular to walls, structural members, or intersections of vertical planes.
- M. Block Walls: Do not install raceways in same horizontal course or vertical cell with reinforcing steel.
- N. Install watertight fittings in outdoor, underground, or wet locations.
- O. Paint threads and cut ends, before assembly of fittings, galvanized conduit, PVC-coated galvanized conduit, or IMC installed in exposed or damp locations with zinc-rich paint or liquid galvanizing compound.
- P. Metal conduit shall be reamed, burrs removed, and cleaned before installation of conductors, wires, or cables.
- Q. Do not install raceways in concrete equipment pads, foundations, or beams without Engineer approval.
- R. Horizontal raceways installed under floor slabs shall lie completely under slab, with no part embedded within slab.

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- S. Install concealed, embedded, and buried raceways so that they emerge at right angles to surface and have no curved portion exposed.
- T. Install conduits for fiber optic cables, telephone cables, and Category 6 data cables in strict conformance with the requirements of TIA 569B.

3.02 REUSE OF EXISTING CONDUITS

- A. Where Drawings indicate existing conduits may be reused, they may be reused only where they meet the following criteria.
 - 1. Conduit is in useable condition with no deformation, corrosion, or damage to exterior surface.
 - 2. Conduit is sized per the NEC.
 - 3. Conduit is of the type specified in Contract Documents.
 - 4. Conduit is supported as specified in Contract Documents.
- B. Conduit shall be reamed with wire brush, then with a mandrel approximately 1/4 inch smaller than raceway inside diameter then cleaned prior to pulling new conductors.

3.03 INSTALLATION IN CAST-IN-PLACE STRUCTURAL CONCRETE

- A. Minimum Cover: 2 inches, including fittings.
- B. Conduit placement shall not require changes in reinforcing steel location or configuration.
- C. Provide nonmetallic support during placement of concrete to ensure raceways remain in position.
- D. Conduit larger than 1 inch shall not be embedded in concrete slabs, walls, foundations, columns, or beams unless approved by Engineer.
- E. Slabs and Walls (Requires Engineer Approval):
 - 1. Trade size of conduit not to exceed one-fourth of slab or wall thickness.
 - 2. Install within middle two-fourths of slab or wall.
 - 3. Separate conduit less than 2-inch trade size by a minimum ten times conduit trade size, center-to-center, unless otherwise shown.
 - 4. Separate conduit 2-inch and greater trade size by a minimum eight times conduit trade size, center-to-center, unless otherwise shown.
 - 5. Cross conduit at an angle greater than 45 degrees, with minimum separation of 1 inch.

6. Separate conduit by a minimum six times the outside dimension of expansion/deflection fittings at expansion joints.
 7. Conduit shall not be installed below the maximum water surface elevation in walls of water holding structures.
- F. Columns and Beams (Requires Engineer Approval):
1. Trade size of conduit not to exceed one-fourth of beam thickness.
 2. Conduit cross-sectional area not to exceed 4 percent of beam or column cross section.

3.04 CONDUIT APPLICATION

- A. Diameter: Minimum 3/4 inch.
- B. Exterior, Exposed: Aluminum.
- C. Interior, Exposed: Aluminum.
- D. Interior, Concealed (Not Embedded in Concrete): Aluminum.
- E. Aboveground, Embedded in Concrete Walls, Ceilings, or Floors: PVC Schedule 40.
- F. Direct Earth Burial: PVC-coated rigid aluminum.
- G. Concrete-Encased Ductbank: PVC Schedule 40 for ac circuits ,PVC-Coated Rigid Galvanized Steel for dc circuits.
- H. Under Slabs-On-Grade: Aluminum.
- I. Transition from Underground or Concrete Embedded to Exposed: PVC-coated rigid aluminum conduit.
- J. Under Equipment Mounting Pads: Rigid aluminum conduit.
- K. Exterior Light Pole Foundations: PVC-coated rigid aluminum conduit.
- L. Corrosive Areas: PVC-coated rigid aluminum.
- M. Hazardous Gas Areas: Rigid aluminum.

3.05 FLEXIBLE CONNECTIONS

- A. For motors, wall or ceiling mounted fans and unit heaters, dry type transformers, electrically operated valves, instrumentation, and other locations approved by Engineer where flexible connection is required to minimize vibration:
 - 1. Conduit Size 4 Inches or Less: Flexible, liquid-tight conduit.
 - 2. Conduit Size Over 4 Inches: Nonflexible.
 - 3. Wet or Corrosive Areas: Flexible metal liquid-tight.
 - 4. Dry Areas: Flexible, metallic liquid-tight.
 - 5. Hazardous Areas: Flexible coupling suitable for Class I, Division 1 and 2 areas.
- B. Suspended Lighting Fixtures in Dry Areas: Flexible steel, nonliquid-tight conduit.
- C. Outdoor Areas, Process Areas Exposed to Moisture, and Areas Required to be Oiltight and Dust-Tight: Flexible metal, liquid-tight conduit.
- D. Flexible Conduit Length: 18 inches minimum, 60 inches maximum; sufficient to allow movement or adjustment of equipment.

3.06 PENETRATIONS

- A. Make at right angles, unless otherwise shown.
- B. Notching or penetration of structural members, including footings and beams, not permitted.
- C. Fire-Rated Walls, Floors, or Ceilings: Firestop openings around penetrations to maintain fire-resistance rating as specified in Section 26 05 04, Basic Electrical Materials and Methods.
- D. Apply heat shrinkable tubing or single layer of wraparound duct band to metallic conduit protruding through concrete floor slabs to a point 2 inches above and 2 inches below concrete surface.
- E. Concrete Walls, Floors, or Ceilings (Aboveground): Provide nonshrink grout dry-pack, or use watertight seal device.

F. Entering Structures:

1. General: Seal raceway at first box or outlet with oakum or expandable plastic compound to prevent entrance of gases or liquids from one area to another.
2. Concrete Roof or Membrane Waterproofed Wall or Floor:
 - a. Provide a watertight seal.
 - b. Without Concrete Encasement: Install watertight entrance seal device on each side.
 - c. With Concrete Encasement: Install watertight entrance seal device on accessible side.
 - d. Securely anchor malleable iron body of watertight entrance seal device into construction with one or more integral flanges.
 - e. Secure membrane waterproofing to watertight entrance seal device in a permanent, watertight manner.
3. Heating, Ventilating, and Air Conditioning Equipment:
 - a. Penetrate equipment in area established by manufacturer.
 - b. Terminate conduit with flexible metal conduit at junction box or conduit attached to exterior surface of equipment prior to penetrating equipment.
4. Corrosive-Sensitive Areas: Seal conduit entering equipment panel boards and field panels containing electronic equipment.
5. Existing or Precast Wall (Underground): Core drill wall and install watertight entrance seal device.
6. Nonwaterproofed Wall or Floor (Underground, without Concrete Encasement):
 - a. Provide Schedule 40 galvanized pipe sleeve, or watertight entrance seal device.
 - b. Fill space between raceway and sleeve with expandable plastic compound or oakum and lead joint, on each side.
7. Manholes and Handholes:
 - a. Metallic Raceways: Provide insulated grounding bushings.
 - b. Nonmetallic Raceways: Provide bell ends flush with wall.
 - c. Install such that raceways enter as near as possible to one end of wall, unless otherwise shown.

3.07 SUPPORT

- A. Support from structural members only, at intervals not exceeding NFPA 70 requirements. Do not exceed 10 feet in any application. Do not support from piping, pipe supports, or other raceways.
- B. Multiple Adjacent Raceways: Provide ceiling trapeze.

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- C. Application/Type of Conduit Strap:
1. Aluminum Conduit: Aluminum or stainless steel.
 2. Rigid Steel or EMT Conduit: Zinc coated steel, pregalvanized steel or malleable iron.
 3. PVC-Coated Rigid Steel Conduit: PVC-coated metal.
 4. Nonmetallic Conduit: Nonmetallic or PVC-coated metal.
- D. Provide and attach wall brackets, strap hangers, or ceiling trapeze as follows:
1. Wood: Wood screws.
 2. Hollow Masonry Units: Toggle bolts.
 3. Concrete or Brick: Expansion shields, or threaded studs driven in by powder charge, with lock washers and nuts.
 4. Steelwork: Machine screws.
 5. Location/Type of Hardware:
 - a. Dry, Noncorrosive Areas: Galvanized.
 - b. Wet, Noncorrosive Areas: Stainless steel.
 - c. Corrosive Areas: Stainless steel.
- E. Nails or wooden plugs inserted in concrete or masonry for attaching raceway not permitted. Do not weld raceways or pipe straps to steel structures. Do not use wire in lieu of straps or hangers.
- F. Support aluminum conduit on concrete surfaces with stainless steel or nonmetallic spacers, or aluminum or nonmetallic framing channel.

3.08 BENDS

- A. Install concealed raceways with a minimum of bends in the shortest practical distance.
- B. Make bends and offsets of longest practical radius. Bends in conduits and ducts being installed for fiber optic cables shall be not less than 20 times cable diameter, 15 inches minimum.
- C. Install with symmetrical bends or cast metal fittings.
- D. Avoid field-made bends and offsets, but where necessary, make with acceptable hickey or bending machine. Do not heat metal raceways to facilitate bending.
- E. Make bends in parallel or banked runs from same center or centerline with same radius so that bends are parallel.

- F. Factory elbows may be installed in parallel or banked raceways if there is change in plane of run, and raceways are same size.
- G. PVC Conduit:
 - 1. Bends 30 Degrees and Larger: Provide factory-made elbows.
 - 2. 90-Degree Bends: Provide rigid steel elbows, PVC-coated where direct buried.
 - 3. Use manufacturer's recommended method for forming smaller bends.
- H. Flexible Conduit: Do not make bends that exceed allowable conductor bending radius of cable to be installed or that significantly restricts conduit flexibility.

3.09 EXPANSION/DEFLECTION FITTINGS

- A. Provide on raceways at structural expansion joints and in long tangential runs.
- B. Provide expansion/deflection joints for 25 degrees F maximum temperature variation.
- C. Install in accordance with manufacturer's instructions.

3.10 PVC CONDUIT

- A. Solvent Welding:
 - 1. Apply manufacturer recommended solvent to joints.
 - 2. Install in order that joint is watertight.
- B. Adapters:
 - 1. PVC to Metallic Fittings: PVC terminal type.
 - 2. PVC to Rigid Metal Conduit or IMC: PVC female adapter.
- C. Belled-End Conduit: Bevel unbelled end of joint prior to joining.

3.11 PVC-COATED RIGID STEEL AND RIGID ALUMINUM CONDUIT

- A. Install in accordance with manufacturer's instructions.
- B. Tools and equipment used in cutting, bending, threading and installation of PVC-coated rigid conduit shall be designed to limit damage to PVC coating.
- C. Provide PVC boot to cover exposed threading.

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3.12 WIREWAYS

- A. Install in accordance with manufacturer's instructions.
- B. Locate with cover on accessible vertical face of wireway, unless otherwise shown.
- C. Applications:
 - 1. Metal wireway in indoor dry locations.
 - 2. Nonmetallic wireway in indoor wet, outdoor, and corrosive locations.

3.13 TERMINATION AT ENCLOSURES

- A. Cast Metal Enclosure: Install manufacturer's premolded insulating sleeve inside metallic conduit terminating in threaded hubs.
- B. Nonmetallic, Cabinets, and Enclosures:
 - 1. Terminate conduit in threaded conduit hubs, maintaining enclosure integrity.
 - 2. Metallic Conduit: Provide ground terminal for connection to maintain continuity of ground system.
- C. Sheet Metal Boxes, Cabinets, and Enclosures:
 - 1. General:
 - a. Install insulated bushing on ends of conduit where grounding is not required.
 - b. Provide insulated throat when conduit terminates in sheet metal boxes having threaded hubs.
 - c. Utilize sealing locknuts or threaded hubs on sides and bottom of NEMA 3R and NEMA 12 enclosures.
 - d. Terminate conduits at threaded hubs at the tops of NEMA 3R and NEMA 12 boxes and enclosures.
 - e. Terminate conduits at threaded conduit hubs at NEMA 4 and NEMA 4X boxes and enclosures.
 - 2. Rigid Galvanized or Aluminum Conduit:
 - a. Provide one lock nut each on inside and outside of enclosure.
 - b. Install grounding bushing at source enclosure.
 - c. Provide bonding jumper from grounding bushing to equipment ground bus or ground pad.
 - 3. Electric Metallic Tubing: Provide gland compression, insulated connectors.
 - 4. Flexible Metal Conduit: Provide two screw type, insulated, malleable iron connectors.

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5. Flexible, Nonmetallic Conduit: Provide nonmetallic, liquid-tight strain relief connectors.
6. PVC-Coated Rigid Galvanized Steel Conduit: Provide PVC-coated, liquid-tight, metallic connector.
7. PVC Schedule 40 Conduit: Provide PVC terminal adapter with lock nut, except where threaded hubs required above.

3.14 UNDERGROUND RACEWAYS

- A. Grade: Maintain minimum grade of 4 inches in 100 feet, either from one manhole, handhole, or pull box to the next, or from a high point between them, depending on surface contour.
- B. Cover: Maintain minimum 2-foot cover above conduit and concrete encasement, unless otherwise shown.
- C. Make routing changes as necessary to avoid obstructions or conflicts.
- D. Couplings: In multiple conduit runs, stagger so couplings in adjacent runs are not in same transverse line.
- E. Union type fittings not permitted.
- F. Spacers:
 1. Provide preformed, nonmetallic spacers designed for such purpose, to secure and separate parallel conduit runs in a trench or concrete encasement.
 2. Install at intervals not greater than that specified in NFPA 70 for support of the type conduit used, but in no case greater than 10 feet.
- G. Support conduit so as to prevent bending or displacement during backfilling or concrete placement.
- H. Transition from Underground to Exposed: PVC-coated rigid steel conduit.
- I. Installation with Other Piping Systems:
 1. Crossings: Maintain minimum 12-inch vertical separation.
 2. Parallel Runs: Maintain minimum 12-inch separation.
 3. Installation over valves or couplings not permitted.
- J. Metallic Raceway Coating: At couplings and joints, apply wraparound duct band with one-half tape width overlap to obtain two complete layers.

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- K. Provide expansion fittings that allow minimum of 4 inches of movement in vertical conduit runs from underground where exposed conduit will be fastened to or will enter building or structure.
- L. Provide expansion/deflection fittings in conduit runs that exit building or structure belowgrade. Conduit from building wall to fitting shall be PVC-coated rigid steel.
- M. Concrete Encasement: As specified in Section 03 30 10, Structural Concrete.
- N. Backfill:
 - 1. As specified in Section 31 23 23.15, Trench Backfill.
 - 2. Do not backfill until inspected by Engineer.

3.15 UNDER SLAB RACEWAYS

- A. Make routing changes as necessary to avoid obstructions or conflicts.
- B. Support raceways so as to prevent bending or displacement during backfilling or concrete placement.
- C. Install raceways with no part embedded within slab and with no interference with slab on grade construction.
- D. Raceway spacing, in a single layer or multiple layers:
 - 1. 3 inches clear between adjacent 2-inch or larger raceway.
 - 2. 2 inches clear between adjacent 1-1/2-inch or smaller raceway.
- E. Multiple Layers of Raceways: Install under slab on grade in trench below backfill zone, as specified in Section 31 23 23.15, Trench Backfill.
- F. Individual Raceways and Single Layer Multiple Raceways: Install at lowest elevation of backfill zone with spacing as specified herein. Where conduits cross at perpendicular orientation, installation of conduits shall not interfere with placement of under slab fill that meets compaction and void limitations of earthwork specifications.
- G. Under slab raceways that emerge from below slab to top of slab as exposed, shall be located to avoid conflicts with structural slab rebar. Coordinate raceway stub ups with location of structural rebar.

H. Fittings:

1. Union type fittings are not permitted.
2. Provide expansion/deflection fittings in raceway runs that exit building or structure below slab. Locate fittings 18 inches, maximum, beyond exterior wall. Raceway type between building exterior wall to fitting shall be PVC-coated rigid steel.
3. Couplings: In multiple raceway runs, stagger so couplings in adjacent runs are not in same traverse line.

3.16 OUTLET AND DEVICE BOXES

A. General:

1. Install plumb and level.
2. Install suitable for conditions encountered at each outlet or device in wiring or raceway system, sized to meet NFPA 70 requirements.
3. Open no more knockouts in sheet steel device boxes than are required; seal unused openings.
4. Install galvanized mounting hardware in industrial areas.

B. Size:

1. Depth: Minimum 2 inches, unless otherwise required by structural conditions. Box extensions not permitted.
 - a. Hollow Masonry Construction: Install with sufficient depth such that conduit knockouts or hubs are in masonry void space.
2. Ceiling Outlet: Minimum 4-inch octagonal device box, unless otherwise required for installed fixture.
3. Switch and Receptacle: Minimum 2-inch by 4-inch device box.

C. Locations:

1. Drawing locations are approximate.
2. To avoid interference with mechanical equipment or structural features, relocate outlets as directed by Engineer.
3. Light Fixture: Install in symmetrical pattern according to room layout, unless otherwise shown.

D. Mounting Height:

1. General:
 - a. Dimensions given to centerline of box.
 - b. Where specified heights do not suit building construction or finish, adjust up or down to avoid interference.
 - c. Do not straddle CMU block or other construction joints.
2. Light Switch:
 - a. 48 inches above floor.
 - b. When located next to door, install on lock side of door.
3. Thermostat: 54 inches above floor.
4. Telephone Outlet:
 - a. 15 inches above floor.
 - b. 6 inches above counter tops.
 - c. Wall Mounted: 52 inches above floor.
5. Convenience Receptacle:
 - a. General Interior Areas: 18 inches above floor.
 - b. General Interior Areas (Counter Tops): Install device plate bottom or side flush with top of backsplash, or 6 inches above counter tops without backsplash.
 - c. Industrial Areas, Workshops: 48 inches above floor.
 - d. Outdoor Areas: 24 inches above finished grade.
6. Switch, Motor Starting: 48 inches above floor, unless otherwise indicated on Drawings.

E. Flush Mounted:

1. Install with concealed conduit.
2. Install proper type extension rings or plaster covers to make edges of boxes flush with finished surface.
3. Holes in surrounding surface shall be no larger than required to receive box.

F. Supports:

1. Support boxes independently of conduit by attachment to building structure or structural member.
2. Install bar hangers in frame construction or fasten boxes directly as follows:
 - a. Wood: Wood screws.
 - b. Concrete or Brick: Bolts and expansion shields.
 - c. Hollow Masonry Units: Toggle bolts.
 - d. Steelwork: Machine screws.

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3. Threaded studs driven in by powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields.
 4. Provide plaster rings where necessary.
 5. Boxes embedded in concrete or masonry need not be additionally supported.
- G. Install separate junction boxes for flush or recessed lighting fixtures where required by fixture terminal temperature.
- H. Boxes Supporting Fixtures: Provide means of attachment with adequate strength to support fixture.

3.17 JUNCTION AND PULL BOXES

A. General:

1. Install plumb and level.
2. Installed boxes shall be accessible.
3. Do not install on finished surfaces.
4. Use outlet boxes as junction and pull boxes wherever possible and allowed by applicable codes.
5. Use conduit bodies as junction and pull boxes where no splices are required and allowed by applicable codes.
6. Install pull boxes where necessary in raceway system to facilitate conductor installation.
7. Install where shown and where necessary to terminate, tap-off, or redirect multiple conduit runs.
8. Install in conduit runs at least every 150 feet or after the equivalent of three right-angle bends.

B. Flush Mounted:

1. Install with concealed conduit.
2. Holes in surrounding surface shall be no larger than required to receive box.
3. Make edges of boxes flush with final surface.

C. Mounting Hardware:

1. Noncorrosive Dry Areas: Aluminum.
2. Noncorrosive Wet Areas: Stainless steel.
3. Corrosive Areas: Stainless steel.

D. Supports:

1. Support boxes independently of conduit by attachment to building structure or structural member.
2. Install bar hangers in frame construction or fasten boxes directly as follows:
 - a. Wood: Wood screws.
 - b. Concrete or Brick: Bolts and expansion shields.
 - c. Hollow Masonry Units: Toggle bolts.
 - d. Steelwork: Machine screws.
3. Threaded studs driven in by powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields.
4. Boxes embedded in concrete or masonry need not be additionally supported.

E. At or Below Grade:

1. Install boxes for below grade conduit flush with finished grade in locations outside of paved areas, roadways, or walkways.
2. If adjacent structure is available, box may be mounted on structure surface just above finished grade in accessible but unobtrusive location.
3. Obtain Engineer's written acceptance prior to installation in paved areas, roadways, or walkways.
4. Use boxes and covers suitable to support anticipated weights.

3.18 EMPTY RACEWAYS

- A. Provide permanent, removable cap over each end.
- B. Provide PVC plug with pull tab for underground raceways with end bells.
- C. Provide nylon pull cord.
- D. Identify, as specified in Article Identification Devices, with waterproof tags attached to pull cord at each end, and at intermediate pull point.

3.19 IDENTIFICATION DEVICES

A. Raceway Tags:

1. Identify origin and destination.
2. For exposed raceways, install tags at each terminus, near midpoint, and at minimum intervals of every 50 feet, whether in ceiling space or surface mounted.
3. Install tags at each terminus for concealed raceways.
4. Provide noncorrosive wire for attachment.

- B. Warning Tape: Install approximately 12 inches above underground or concrete-encased raceways. Align parallel to, and within 12 inches of, centerline of run.
- C. Buried Raceway Marker:
 - 1. Install at grade to indicate direction of underground raceway.
 - 2. Install at bends and at intervals not exceeding 100 feet in straight runs.
 - 3. Embed and secure to top of concrete base, sized 14 inches long, 6 inches wide, and 8 inches deep; top set flush with finished grade.

3.20 PROTECTION OF INSTALLED WORK

- A. Protect products from effects of moisture, corrosion, and physical damage during construction.
- B. Provide and maintain manufactured watertight and dust-tight seals over conduit openings during construction.
- C. Touchup painted conduit threads after assembly to cover nicks or scars.
- D. Touchup coating damage to PVC-coated conduit with patching compound approved by manufacturer. Compound shall be kept refrigerated according to manufacturers' instructions until time of use.

END OF SECTION

SECTION 26 05 70
ELECTRICAL SYSTEMS ANALYSIS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American National Standards Institute (ANSI).
 2. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. C57.12.00, Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.
 - b. 242, Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.
 - c. 399, Recommended Practice for Industrial and Commercial Power System Analysis.
 - d. 1584, Guide for Performing Arc Flash Hazard Calculations.
 3. National Electrical Manufacturers Association (NEMA): Z535.4, Product Safety Signs and Labels.
 4. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
 - b. 70E, Standard for Electrical Safety in the Workplace.
 5. Occupational Safety and Health Standards (OSHA): 29 CFR, Part 1910 Subpart S, Electrical.

1.02 QUALITY ASSURANCE

- A. Short circuit, protective device coordination, and arc flash studies shall be prepared by a professional electrical engineer registered in the State of Florida.

1.03 SEQUENCING AND SCHEDULING

- A. Initial complete short circuit study shall be submitted, reviewed, and approved before Engineer will review Shop Drawings for any electrical equipment.
- B. Initial complete protective device coordination and arc flash studies shall be submitted within 30 days after approval of initial short circuit study.
- C. Initial complete arc flash study shall be submitted and accepted prior to energization of the electrical equipment.
- D. Revised short circuit, protective device coordination, and arc flash studies, and arc flash labels shall be submitted 10 days before energizing electrical equipment.

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- E. Final short circuit, protective device coordination, and arc flash studies shall be completed prior to Project Substantial Completion. Final version of study shall include as-installed equipment, materials, and parameter data or settings entered into equipment based on study.
- F. Submit final arc flash labels described herein and in compliance with NEMA Z535.4 prior to Project Substantial Completion.

1.04 GENERAL STUDY REQUIREMENTS

- A. Equipment and component titles used in the studies shall be identical to equipment and component titles shown on Drawings.
- B. Perform studies using one of the following electrical engineering software packages:
 - 1. SKM Power Tools for Windows.
 - 2. ETAP.
 - 3. Paladin.
 - 4. Easy Power.
- C. Perform complete fault calculations for each proposed and ultimate source combination.
 - 1. Source combination may include present and future power company supply circuits, large motors, or generators.
- D. Utilize proposed load data for study obtained from Contract Documents.
- E. Device coordination time-current curves for low voltage distribution system; include individual protective device time-current characteristics.

1.05 SHORT CIRCUIT STUDY

- A. General:
 - 1. Prepare in accordance with IEEE 399.
 - 2. Use cable impedances based on copper conductors, except where aluminum conductors are specified or shown.
 - 3. Use bus impedances based on copper bus bars, except where aluminum bus bars are specified or shown.
 - 4. Use cable and bus resistances calculated at 25 degrees C.
 - 5. Use medium-voltage cable reactances based on use of typical dimensions of shielded cables with 133 percent insulation levels.

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6. Use 600-volt cable reactances based on use of typical dimensions of THHN/THWN conductors.
 7. Use transformer impedances 92.5 percent of “nominal” impedance based on tolerances specified in IEEE C57.12.00.
- B. Provide:
1. Calculation methods and assumptions.
 2. Typical calculation.
 3. Tabulations of calculated quantities.
 4. Results, conclusions, and recommendations.
 5. Selected base per unit quantities.
 6. One-line diagrams.
 7. Source impedance data, including electric utility system and motor fault contribution characteristics.
 8. Impedance diagrams.
 9. Zero-sequence impedance diagrams.
- C. Calculate short circuit interrupting and momentary (when applicable) duties for an assumed three-phase bolted fault at each:
1. Electric utility’s supply termination point.
 2. Service Entrance Rated 200A Main Fusible Disconnect.
 3. Branch circuit panelboards.
 4. Pump Control Panel.
 5. Future load contributions as shown on one-line diagram.
- D. Provide bolted line-to-ground fault current study for areas as defined for three-phase bolted fault short circuit study.
- E. Provide bolted line-to-line fault current study for areas as defined for three-phase bolted fault short circuit study.
- F. Verify:
1. Equipment and protective devices are applied within their ratings.
 2. Adequacy of proposed equipment to withstand short circuit stresses.
 3. Adequacy of transformer windings to withstand short circuit stresses.
 4. Cable sizes for ability to withstand short circuit heating, in addition to normal load currents.

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G. Tabulations:

1. General Data:
 - a. Short circuit reactances of rotating machines.
 - b. Cable and conduit material data.
 - c. Bus data.
 - d. Transformer data.
 - e. Circuit resistance and reactance values.
2. Short Circuit Data (for each source combination):
 - a. Fault impedances.
 - b. X to R ratios.
 - c. Asymmetry factors.
 - d. Motor contributions.
 - e. Short circuit kVA.
 - f. Symmetrical and asymmetrical fault currents.
3. Equipment Evaluation:
 - a. Equipment bus bracing, equipment short circuit rating, transformer, cable, busway.
 - b. Maximum fault current available.

H. Written Summary:

1. Scope of studies performed.
2. Explanation of bus and branch numbering system.
3. Prevailing conditions.
4. Selected equipment deficiencies.
5. Results of short circuit study.
6. Comments or suggestions.

I. Suggest changes and additions to equipment rating and/or characteristics.

J. Notify Engineer in writing of existing circuit protective devices improperly rated for new fault conditions.

K. Revise data for “as-installed” condition.

1.06 PROTECTIVE DEVICE COORDINATION STUDY

A. General:

1. Prepare in accordance with IEEE 242.
2. Proposed protective device coordination time-current curves for distribution system, graphically displayed on conventional log-log curve sheets.
 - a. Provide separate curve sheets for phase and ground fault coordination for each scenario.

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- b. Each curve sheet to have title and one-line diagram that applies to specific portion of system associated with time-current curves on that sheet. Limit number of devices shown to four to six.
- c. Identify device associated with each curve by manufacturer type, function, and, if applicable, recommended tap, time delay, instantaneous and other settings recommended.
- d. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which device is exposed.
- e. Apply motor protection methods that comply with NFPA 70.

B. Plot Characteristics on Curve Sheets:

- 1. Electric utility's relays.
- 2. Electric utility's fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
- 3. Low-voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
- 4. Low-voltage equipment circuit breaker trip devices, including manufacturers tolerance bands.
- 5. Pertinent transformer full-load currents at 100 percent.
- 6. Transformer magnetizing inrush currents.
- 7. Transformer damage curves; appropriate for system operation and location.
- 8. ANSI transformer withstand parameters.
- 9. Significant symmetrical and asymmetrical fault currents.
- 10. Motor overload relay settings for motors 20 HP or greater.
- 11. Ground fault protective device settings.
- 12. Other system load protective devices for largest branch circuit and feeder circuit breaker in each motor control center.

C. Primary Protective Device Settings for Delta-Wye Connected Transformer:

- 1. Secondary Line-to-Ground Fault Protection: Primary protective device operating band within transformer's characteristics curve, including a point equal to 58 percent of IEEE C57.12.00 withstand point.
- 2. Secondary Line-to-Line Faults: 16 percent current margin between primary protective device and associated secondary device characteristic curves.

D. Separate medium voltage relay characteristics curves from curves for other devices by at least 0.4-second time margin.

E. Tabulate Recommended Protective Device Settings:

- 1. Relays:
 - a. Current tap.
 - b. Time dial.

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- c. Instantaneous pickup.
- d. Electronic settings data file.
2. Circuit Breakers:
 - a. Adjustable pickups.
 - b. Adjustable time-current characteristics.
 - c. Adjustable time delays.
 - d. Adjustable instantaneous pickups.
 - e. I²t In/Out.
 - f. Zone interlocking.
 - g. Electronic settings data file.

F. Written Summary:

1. Scope of studies performed.
2. Summary of protective device coordination methodology.
3. Prevailing conditions.
4. Selected equipment deficiencies.
5. Results of coordination study.
6. Appendix of complete relay and circuit breaker electronic setting files, submit electronic data files from manufacturer's software.
7. Comments or suggestions.

1.07 ARC FLASH STUDY

- A. Perform arc flash hazard study after short circuit and protective device coordination study has been completed, reviewed and accepted.
- B. Perform arc flash study in accordance with NFPA 70E, OSHA 29 CFR, Part 1910 Subpart S, and IEEE 1584.
- C. Base Calculation: For each major part of electrical power system, determine the following:
 1. Flash hazard protection boundary.
 2. Limited approach boundary.
 3. Restricted approach boundary.
 4. Incident energy level.
 5. Glove class required.
- D. Produce arc flash warning labels that list items in Paragraph Base Calculation and the following additional items.
 1. Bus name.
 2. Bus voltage.

- E. Produce bus detail sheets that list items in Paragraph Base Calculation and the following additional items:
1. Bus name.
 2. Upstream protective device name, type, and settings.
 3. Bus line-to-line voltage.
- F. Produce arc flash evaluation summary sheet listing the following additional items:
1. Bus name.
 2. Upstream protective device name, type, settings.
 3. Bus line-to-line voltage.
 4. Bus bolted fault.
 5. Protective device bolted fault current.
 6. Arcing fault current.
 7. Protective device trip/delay time.
 8. Breaker opening time.
 9. Solidly grounded column.
 10. Equipment type.
 11. Gap.
 12. Arc flash boundary.
 13. Working distance.
 14. Incident energy.
- G. Analyze short circuit, protective device coordination, and arc flash calculations and highlight equipment that is determined to be underrated or causes incident energy values greater than 40 cal/cm². Propose approaches to reduce energy levels.
- H. Prepare report summarizing arc flash study with conclusions and recommendations which may affect integrity of electric power distribution system. As a minimum, include the following:
1. Equipment manufacturer's information used to prepare study.
 2. Assumptions made during study.
 3. Reduced copy of one-line drawing; 11 inches by 17 inches maximum.
 4. Arc flash evaluations summary spreadsheet.
 5. Bus detail sheets.
 6. Arc flash warning labels printed in color on thermally bonded adhesive backed UV and weather-resistant labels.

PART 2 PRODUCTS

2.01 ARC FLASH WARNING LABELS

- A. Arc flash warning labels printed in color on thermally bonded adhesive backed, UV- and weather-resistant labels. An example label is located following end of section in Figure 1.

PART 3 EXECUTION

3.01 GENERAL

- A. Adjust relay and protective device settings according to values established by coordination study.
- B. Make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.
- C. Notify Engineer in writing of required major equipment modifications.
- D. Provide laminated one-line diagrams (minimum size 11 inches by 17 inches) to post on interior of electrical room doors.
- E. Provide arc flash warning labels on equipment as specified in this section.

3.02 SUPPLEMENTS

- A. The supplement listed below, following “End of Section,” is a part of this Specification:
 - 1. Figure 1: Example Arc Flash Label.

END OF SECTION

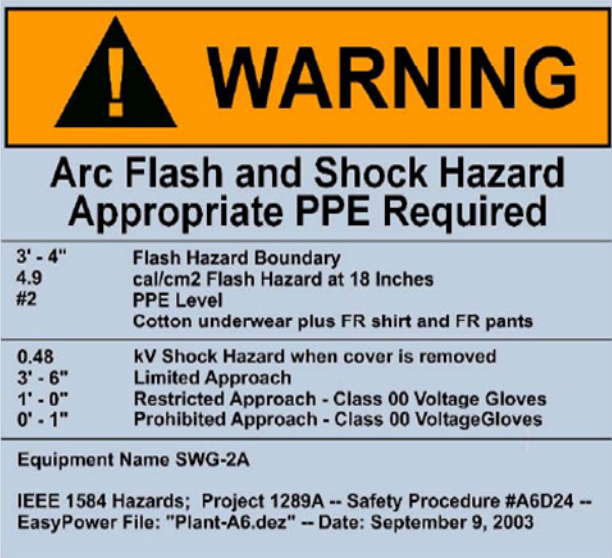


Figure 1
Example Arc Flash Label

SECTION 26 08 00
COMMISSIONING OF ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. D877/D877M, Standard Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes.
 - b. D923, Standard Practices for Sampling Electrical Insulating Liquids.
 - c. D924, Standard Test Method for Dissipation Factor (or Power Factor) and Relative Permittivity (Dielectric Constant) of Electrical Insulating Liquids.
 - d. D971, Standard Test Method for Interfacial Tension of Oil Against Water by the Ring Method.
 - e. D974, Standard Test Method for Acid and Base Number by Color-Indicator Titration.
 - f. D1298, Standard Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method.
 - g. D1500, Standard Test Method for ASTM Color of Petroleum Products (ASTM Color Scale).
 - h. D1524, Standard Test Method for Visual Examination of Used Electrical Insulating Liquids in the Field.
 - i. D1533, Standard Test Method for Water in Insulating Liquids by Coulometric Karl Fischer Titration.
 - j. D1816, Standard Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using VDE Electrodes.
 2. Institute of Electrical and Electronics Engineers (IEEE):
 - a. 43, Recommended Practice for Testing Insulation Resistance of Electric Machinery.
 - b. 48, Standard Test Procedures and Requirements for Alternating-Current Cable Terminators Used on Shielded Cables Having Laminated Insulation Rated 2.5 kV through 765 kV or Extruded Insulation Rated 2.5 kV through 500 kV.
 - c. 81, Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
 - d. 95, Recommended Practice for Insulation Testing of AC Electric Machinery (2300V and Above) with High Direct Voltage.

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- e. 386, Standard for Separable Insulated Connector Systems for Power Distribution Systems Above 600V.
 - f. 400, Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable Systems Rated 5 kV and Above.
 - g. 450, Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications.
 - h. C2, National Electrical Safety Code.
 - i. C37.20.1, Standard for Metal-Enclosed Low-Voltage (1000V ac and below, 3200V dc and below) Power Circuit Breaker Switchgear.
 - j. C37.20.2, Standard for Metal-Clad Switchgear.
 - k. C37.20.3, Standard for Metal-Enclosed Interrupter Switchgear.
 - l. C37.23, Standard for Metal-Enclosed Bus.
 - m. C62.33, Standard Test Methods and Performance Values for Metal-Oxide Varistor Surge Protective Components.
3. Insulated Cable Engineers Association (ICEA):
 - a. S-93-639, 5-46 kV Shielded Power Cables for Use in the Transmission and Distribution of Electric Energy.
 - b. S-94-649, Concentric Neutral Cables Rated 5 through 46 kV.
 - c. S-97-682, Standard for Utility Shielded Power Cables Rated 5 through 46 kV.
 4. National Electrical Manufacturers Association (NEMA):
 - a. AB 4, Guidelines for Inspection and Preventive Maintenance of Molded Case Circuit Breakers Used in Commercial and Industrial Applications.
 - b. PB 2, Deadfront Distribution Switchboards.
 - c. WC 74, 5-46 kV Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy.
 5. InterNational Electrical Testing Association (NETA): ATS, Acceptance Testing Specifications for Electrical Power Equipment and Systems.
 6. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
 - b. 70B, Recommended Practice for Electrical Equipment Maintenance.
 - c. 70E, Standard for Electrical Safety in the Workplace.
 - d. 101, Life Safety Code.
 7. National Institute for Certification in Engineering Technologies (NICET).
 8. Occupational Safety and Health Administration (OSHA): CFR 29, Part 1910, Occupational Safety and Health Standards.

1.02 SUBMITTALS

A. Informational Submittals:

1. Submit 30 days prior to performing inspections or tests:
 - a. Testing firm qualifications.
 - b. Schedule for performing inspection and tests.
 - c. List of references to be used for each test.
 - d. Sample copy of equipment and materials inspection form(s).
 - e. Sample copy of individual device test form.
 - f. Sample copy of individual system test form.
2. Energization Plan: Prior to initial energization of electrical distribution equipment; include the following:
 - a. Owner's representative sign-off form for complete and accurate arc flash labeling and proper protective device settings for equipment to be energized.
 - b. Staged sequence of initial energization of electrical equipment.
 - c. Lock-Out-Tag-Out plan for each stage of the progressive energization.
 - d. Barricading, signage, and communication plan notifying personnel of newly energized equipment.
3. Submit test or inspection reports and certificates for each electrical item tested within 30 days after completion of test:
4. Operation and Maintenance Data:
 - a. In accordance with Section 01 78 23, Operation and Maintenance Data.
 - b. After test or inspection reports and certificates have been reviewed by Engineer and returned, insert a copy of each in Operation and Maintenance Manual.
5. Programmable Settings: At completion of Performance Demonstration Test, submit final hardcopy printout and electronic files on compact disc of as-left setpoints, programs, and device configuration files for:
 - a. Protective relays.
 - b. Intelligent overload relays.
 - c. Adjustable frequency drives.
 - d. Power metering devices.
 - e. Electrical communications modules.

1.03 QUALITY ASSURANCE

A. Testing Firm Qualifications:

1. Corporately and financially independent organization functioning as an unbiased testing authority.

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2. Professionally independent of manufacturers, suppliers, and installers of electrical equipment and systems being tested.
 3. Employer of engineers and technicians regularly engaged in testing and inspecting of electrical equipment, installations, and systems.
 4. Supervising engineer accredited as Certified Electrical Test Technologist by NICET or NETA and having a minimum of 5 years' testing experience on similar projects.
 5. Technicians certified by NICET or NETA.
 6. Assistants and apprentices assigned to Project at ratio not to exceed two certified to one noncertified assistant or apprentice.
 7. Registered Professional Engineer to provide comprehensive Project report outlining services performed, results of such services, recommendations, actions taken, and opinions.
 8. In compliance with OSHA CFR 29, Part 1910.7 criteria for accreditation of testing laboratories or a full member company of NETA.
- B. Test equipment shall have an operating accuracy equal to or greater than requirements established by NETA ATS.
- C. Test Instrument Calibration: In accordance with NETA ATS.

1.04 SEQUENCING AND SCHEDULING

- A. Perform inspection and electrical tests after equipment listed herein has been installed.
- B. Perform tests with apparatus de-energized whenever feasible.
1. Scheduled with Engineer and Owner prior to de-energization.
 2. Minimized to avoid extended period of interruption to the operating plant equipment.
- C. Notify Engineer and Owner at least 24 hours prior to performing tests on energized electrical equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Perform tests in accordance with requirements of Section 01 91 14, Equipment Testing and Facility Startup.

- B. Tests and inspections shall establish:
 - 1. Electrical equipment is operational within industry and manufacturer's tolerances and standards.
 - 2. Installation operates properly.
 - 3. Equipment is suitable for energization.
 - 4. Installation conforms to requirements of Contract Documents and NFPA 70, NFPA 70E, NFPA 101, and IEEE C2.
- C. Perform inspection and testing in accordance with NETA ATS, industry standards, and manufacturer's recommendations.
- D. Set, test, and calibrate protective relays, circuit breakers, fuses, power monitoring meters, and other applicable devices in accordance with values established by short circuit and, coordination studies as specified in Section 26 05 70, Electrical Systems Analysis.
- E. Adjust mechanisms and moving parts of equipment for free mechanical movement.
- F. Adjust and set electromechanical electronic relays and sensors to correspond to operating conditions, or as recommended by manufacturer.
- G. Verify nameplate data for conformance to Contract Documents and approved Submittals.
- H. Realign equipment not properly aligned and correct unlevelness.
- I. Properly anchor electrical equipment found to be inadequately anchored.
- J. Tighten accessible bolted connections, including wiring connections, with calibrated torque wrench/screw driver to manufacturer's recommendations, or as otherwise specified in NETA ATS.
- K. Clean contaminated surfaces with cleaning solvents as recommended by manufacturer.
- L. Provide proper lubrication of applicable moving parts.
- M. Inform Engineer of working clearances not in accordance with NFPA 70.
- N. Investigate and repair or replace:
 - 1. Electrical items that fail tests.
 - 2. Active components not operating in accordance with manufacturer's instructions.
 - 3. Damaged electrical equipment.

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- O. Electrical Enclosures:
 - 1. Remove foreign material and moisture from enclosure interior.
 - 2. Vacuum and wipe clean enclosure interior.
 - 3. Remove corrosion found on metal surfaces.
 - 4. Repair or replace, as determined by Engineer, door and panel sections having dented surfaces.
 - 5. Repair or replace, as determined by Engineer, poor fitting doors and panel sections.
 - 6. Repair or replace improperly operating latching, locking, or interlocking devices.
 - 7. Replace missing or damaged hardware.
 - 8. Finish:
 - a. Provide matching paint and touch up scratches and mars.
 - b. If required because of extensive damage, as determined by Engineer, refinish entire assembly.

- P. Replace fuses and circuit breakers that do not conform to size and type required by the Contract Documents or approved Submittals.

3.02 CHECKOUT AND STARTUP

- A. Voltage Field Test:
 - 1. Check voltage at point of termination of power company supply system to Project when installation is essentially complete and is in operation.
 - 2. Check voltage amplitude and balance between phases for loaded and unloaded conditions.
 - 3. Record supply voltage (all three phases simultaneously on same graph) for 24 hours during normal working day.
 - a. Submit Voltage Field Test Report within 5 days of test.
 - 4. Unbalance Corrections:
 - a. Make written request to power company to correct condition if balance (as defined by NEMA) exceeds 1 percent, or if voltage varies throughout the day and from loaded to unloaded condition more than plus or minus 4 percent of nominal.
 - b. Obtain written certification from responsible power company official that voltage variations and unbalance are within their normal standards if corrections are not made.

- B. Equipment Line Current Tests:
 - 1. Check line current in each phase for each piece of equipment.

2. Make line current check after power company has made final adjustments to supply voltage magnitude or balance.
3. If phase current for a piece of equipment is above rated nameplate current, prepare Equipment Line Phase Current Report that identifies cause of problem and corrective action taken.

3.03 PANELBOARDS

- A. Visual and Mechanical Inspection: Include the following inspections and related work:
 1. Inspect for defects and physical damage, labeling, and nameplate compliance with requirements of up-to-date drawings and panelboard schedules.
 2. Exercise and perform operational tests of mechanical components and other operable devices in accordance with manufacturer's instruction manual.
 3. Check panelboard mounting, area clearances, and alignment and fit of components.
 4. Check tightness of bolted electrical connections with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.
 5. Perform visual and mechanical inspection for overcurrent protective devices.
- B. Electrical Tests: Include the following items performed in accordance with manufacturer's instruction:
 1. Insulation Resistance Tests:
 - a. Applied megohmmeter dc voltage in accordance with NETA ATS, Table 100.1.
 - b. Each phase of each bus section.
 - c. Phase-to-phase and phase-to-ground for 1 minute.
 - d. With breakers open.
 - e. With breakers closed.
 - f. Control wiring except that connected to solid state components.
 - g. Insulation resistance values equal to, or greater than, ohmic values established by manufacturer.
 2. Ground continuity test ground bus to system ground.

3.04 DRY TYPE TRANSFORMERS

- A. Visual and Mechanical Inspection:
 1. Physical and insulator damage.
 2. Proper winding connections.

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3. Bolt torque level in accordance with NETA ATS, Table 100.12, unless otherwise specified by manufacturer.
4. Defective wiring.
5. Proper operation of fans, indicators, and auxiliary devices.
6. Removal of shipping brackets, fixtures, or bracing.
7. Free and properly installed resilient mounts.
8. Cleanliness and improper blockage of ventilation passages.
9. Verify tap-changer is set at correct ratio for rated output voltage under normal operating conditions.
10. Verify proper secondary voltage phase-to-phase and phase-to-ground after energization and prior to loading.

B. Electrical Tests:

1. Insulation Resistance Tests:
 - a. Applied megohmmeter dc voltage in accordance with NETA ATS, Table 100.5 for each:
 - 1) Winding-to-winding.
 - 2) Winding-to-ground.
 - b. Test Duration: 10 minutes with resistances tabulated at 30 seconds, 1 minute, and 10 minutes.
 - c. Results temperature corrected in accordance with NETA ATS, Table 100.14.
 - d. Temperature corrected insulation resistance values equal to, or greater than, ohmic values established by manufacturer.
 - e. Insulation resistance test results to compare within 1 percent of adjacent windings.
2. Perform tests and adjustments for fans, controls, and alarm functions as suggested by manufacturer.

3.05 LOW VOLTAGE CABLES, 600 VOLTS MAXIMUM

A. Visual and Mechanical Inspection:

1. Inspect each individual exposed power cable No. 4 and larger for:
 - a. Physical damage.
 - b. Proper connections in accordance with single-line diagram.
 - c. Cable bends not in conformance with manufacturer's minimum allowable bending radius where applicable.
 - d. Color coding conformance with specification.
 - e. Proper circuit identification.

2. Mechanical Connections for:
 - a. Proper lug type for conductor material.
 - b. Proper lug installation.
 - c. Bolt torque level in accordance with NETA ATS, Table 100.12, unless otherwise specified by manufacturer.
3. Shielded Instrumentation Cables for:
 - a. Proper shield grounding.
 - b. Proper terminations.
 - c. Proper circuit identification.
4. Control Cables for:
 - a. Proper termination.
 - b. Proper circuit identification.
5. Cables Terminated Through Window Type CTs: Verify neutrals and grounds are terminated for correct operation of protective devices.

B. Electrical Tests for Conductors No. 6 and Larger:

1. Insulation Resistance Tests:
 - a. Utilize 1,000-volt dc megohmmeter for 600-volt insulated conductors.
 - b. Test each conductor with respect to ground and to adjacent conductors for 1 minute.
 - c. Evaluate ohmic values by comparison with conductors of same length and type.
 - d. Investigate values less than 50 megohms.
2. Continuity test by ohmmeter method to ensure proper cable connections.

C. Low-voltage cable tests may be performed by installer in lieu of independent testing firm.

3.06 SAFETY SWITCHES, 600 VOLTS MAXIMUM

A. Visual and Mechanical Inspection:

1. Proper blade pressure and alignment.
2. Proper operation of switch operating handle.
3. Adequate mechanical support for each fuse.
4. Proper contact-to-contact tightness between fuse clip and fuse.
5. Cable connection bolt torque level in accordance with NETA ATS, Table 100.12.
6. Proper phase barrier material and installation.
7. Verify fuse sizes and types correspond to one-line diagram or approved Submittals.
8. Perform mechanical operational test and verify electrical and mechanical interlocking system operation and sequencing.

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B. Electrical Tests:

1. Insulation Resistance Tests:
 - a. Applied megohmmeter dc voltage in accordance with NETA ATS, Table 100.1.
 - b. Phase-to-phase and phase-to-ground for 1 minute on each pole.
 - c. Insulation resistance values equal to, or greater than, ohmic values established by manufacturer.
2. Contact Resistance Tests:
 - a. Contact resistance in microhms across each switch blade and fuse holder.
 - b. Investigate deviation of 50 percent or more from adjacent poles or similar switches.

3.07 MOLDED AND INSULATED CASE CIRCUIT BREAKERS

A. General: Inspection and testing limited to circuit breakers rated 100 amperes and larger and to motor circuit protector breakers rated 50 amperes and larger.

B. Visual and Mechanical Inspection:

1. Proper mounting.
2. Proper conductor size.
3. Feeder designation according to nameplate and one-line diagram.
4. Cracked casings.
5. Connection bolt torque level in accordance with NETA ATS, Table 100.12.
6. Operate breaker to verify smooth operation.
7. Compare frame size and trip setting with circuit breaker schedules or one-line diagram.
8. Verify that terminals are suitable for 75 degrees C rated insulated conductors.

C. Electrical Tests:

1. Insulation Resistance Tests:
 - a. Utilize 1,000-volt dc megohmmeter for 480-volt and 600-volt circuit breakers and 500-volt dc megohmmeter for 240-volt circuit breakers.
 - b. Pole-to-pole and pole-to-ground with breaker contacts opened for 1 minute.
 - c. Pole-to-pole and pole-to-ground with breaker contacts closed for 1 minute.
 - d. Test values to comply with NETA ATS, Table 100.1.

2. Contact Resistance Tests:
 - a. Contact resistance in microhms across each pole.
 - b. Investigate deviation of 50 percent or more from adjacent poles and similar breakers.
3. Primary Current Injection Test to Verify:
 - a. Long-time minimum pickup and delay.
 - b. Short-time pickup and delay.
 - c. Ground fault pickup and delay.
 - d. Instantaneous pickup by run-up or pulse method.
 - e. Trip characteristics of adjustable trip breakers shall be within manufacturer's published time-current characteristic tolerance band, including adjustment factors.
 - f. Trip times shall be within limits established by NEMA AB 4, Table 5-3. Alternatively, use NETA ATS, Table 100.7.
 - g. Instantaneous pickup value shall be within values established by NEMA AB 4, Table 5-4. Alternatively, use NETA ATS, Table 100.8.

3.08 INSTRUMENT TRANSFORMERS

A. Visual and Mechanical Inspection:

1. Visually check current, potential, and control transformers for:
 - a. Cracked insulation.
 - b. Broken leads or defective wiring.
 - c. Proper connections.
 - d. Adequate clearances between primary and secondary circuit wiring.
2. Verify Mechanically:
 - a. Grounding and shorting connections have good contact.
 - b. Withdrawal mechanism and grounding operation, when applicable, operate properly.
3. Verify proper primary and secondary fuse sizes for potential transformers.

B. Electrical Tests:

1. Current Transformer Tests:
 - a. Insulation resistance test of transformer and wiring-to-ground at 1,000 volts dc for 30 seconds.
 - b. Polarity test.
 - c. Ratio and accuracy test.
2. Potential Transformer Tests:
 - a. Insulation resistance test at test voltages in accordance with NETA ATS, Table 100.9, for 1 minute on:
 - 1) Winding-to-winding.
 - 2) Winding-to-ground.

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- b. Polarity test to verify polarity marks or H1-X1 relationship as applicable.
- c. Ratio and accuracy test.
3. Insulation resistance measurement on instrument transformer shall not be less than that shown in NETA ATS, Table 100.5.

3.09 METERING

A. Visual and Mechanical Inspection:

1. Verify meter connections in accordance with appropriate diagrams.
2. Verify meter multipliers.
3. Verify meter types and scales conform to Contract Documents.
4. Check calibration of meters at cardinal points.
5. Check calibration of electrical transducers.

3.10 GROUNDING SYSTEMS

A. Visual and Mechanical Inspection:

1. Equipment and circuit grounds in panelboard, assemblies for proper connection and tightness.
2. Ground bus connections in panelboard, assemblies for proper termination and tightness.
3. Effective transformer core and equipment grounding.
4. Accessible connections to grounding electrodes for proper fit and tightness.
5. Accessible exothermic-weld grounding connections to verify that molds were fully filled and proper bonding was obtained.

B. Electrical Tests:

1. Fall-of-Potential Test:
 - a. In accordance with IEEE 81, Section 8.2.1.5 for measurement of main ground system's resistance.
 - b. Main ground electrode system resistance to ground to be no greater than 5 ohm(s).
2. Two-Point Direct Method Test:
 - a. In accordance with IEEE 81, Section 8.2.1.1 for measurement of ground resistance between main ground system, equipment frames, and system neutral and derived neutral points.
 - b. Equipment ground resistance shall not exceed main ground system resistance by 0.50 ohm.

3. Neutral Bus Isolation:
 - a. Test each neutral bus individually with neutral bonding jumper removed at service entrance or separately derived system.
 - b. Evaluate ohmic values by measuring resistance between ground bus and neutral bus.
 - c. Investigate values less than 50 megohms.

3.11 AC INDUCTION MOTORS

- A. General: Inspection and testing limited to motors rated 10 horsepower and larger.
- B. Visual and Mechanical Inspection:
 1. Proper electrical and grounding connections.
 2. Shaft alignment.
 3. Blockage of ventilating air passageways.
 4. Operate motor and check for:
 - a. Excessive mechanical and electrical noise.
 - b. Overheating.
 - c. Correct rotation.
 - d. Check vibration detectors, resistance temperature detectors, or motor inherent protectors for functionality and proper operation.
 - e. Excessive vibration, in excess of values in NETA ATS, Table 100.10.
 5. Check operation of space heaters.
- C. Electrical Tests:
 1. Insulation Resistance Tests:
 - a. In accordance with IEEE 43 at test voltages established by NETA ATS, Table 100.1 for:
 - 1) Motors above 200 horsepower for 10-minute duration with resistances tabulated at 30 seconds, 1 minute, and 10 minutes.
 - 2) Motors 200 horsepower and less for 1-minute duration with resistances tabulated at 30 seconds and 60 seconds.
 - b. Insulation resistance values equal to, or greater than, ohmic values established by manufacturers.
 2. Calculate polarization index ratios for motors above 200 horsepower. Investigate index ratios less than 1.5 for Class A insulation and 2.0 for Class B insulation.
 3. Insulation resistance test on insulated bearings in accordance with manufacturer's instructions.
 4. Measure running current and voltage, and evaluate relative to load conditions and nameplate full-load amperes.

3.12 AUTOMATIC TRANSFER SWITCHES

A. Visual and Mechanical Inspection:

1. Check doors and panels for proper interlocking.
2. Check connections for high resistance by low-resistance ohmmeter calibrated torque wrench applied to bolted joints.
3. Check positive mechanical and electrical interlock between normal and alternate sources.
4. Check for proper operation:
 - a. Manual transfer function switch.
 - b. Generator under load and nonload conditions.
 - c. Auto-exerciser of generator under load and no-load conditions.
5. Verify settings and operation of control devices.

B. Electrical Tests:

1. Insulation Resistance Tests:
 - a. Applied megohmmeter dc voltage in accordance with NETA ATS, Table 100.1, for each phase with switch CLOSED in both source positions.
 - b. Phase-to-phase and phase-to-ground for 1 minute.
 - c. Test values in accordance with manufacturer's published data.
2. Contact Resistance Test:
 - a. Contact resistance in microhms across each switch blade for both source positions.
 - b. Investigate values exceeding 500 micro-ohms.
 - c. Investigate values deviating from adjacent pole by more than 50 percent.
3. Set and calibrate in accordance with Specifications, manufacturer's recommendations, and Coordination Study.
 - a. Voltage and frequency sensing relays.
 - b. Time delay relays.
 - c. Engine start and shutdown relays.
4. Perform automatic transfer tests by:
 - a. Simulating loss of normal power.
 - b. Return to normal power.
 - c. Simulating loss of alternate power.
 - d. Simulating single-phase conditions for normal and alternate sources.
5. Monitor and verify operation and timing of:
 - a. Normal and alternate voltage sensing relays.
 - b. Engine-start sequence.
 - c. Timing delay upon transfer and retransfer.
 - d. Engine cool down and shutdown.

- e. Interlocks and limit switch functions.
- f. Engine cool down and shutdown feature.

3.13 BATTERY SYSTEM

A. Visual and Mechanical Inspection:

- 1. Physical damage and electrolyte leakage.
- 2. Evidence of corrosion.
- 3. Intercell bus link integrity.
- 4. Battery cable insulation damage and contaminated surfaces.
- 5. Operating conditions of ventilating equipment.
- 6. Visual check of electrolyte level.

B. Electrical Tests:

- 1. Measure:
 - a. Bank charging voltage.
 - b. Individual cell voltage.
 - c. Electrolyte specific gravity in each cell.
 - d. Measured test values to be in accordance with manufacturer's published data.
- 2. Verify during recharge mode:
 - a. Charging rates from charger.
 - b. Individual cell acceptance of charge.
- 3. Load tests for integrity and capacity; test values in accordance with IEEE 450.

3.14 LOW VOLTAGE SURGE ARRESTORS

A. Visual and Mechanical Inspection:

- 1. Adequate clearances between arrestors and enclosures.
- 2. Ground connections to ground bus or electrode.

B. Electrical Tests:

- 1. Varistor Type Arrestors:
 - a. Clamping voltage test.
 - b. Rated RMS voltage test.
 - c. Rated dc voltage test.
 - d. Varistor arrestor test values in accordance with IEEE C62.33, Section 4.4 and Section 4.9.

3.15 STANDBY GENERATOR SYSTEMS

A. Visual and Mechanical Inspection:

1. Proper grounding.
2. Blockage of ventilating passageways.
3. Proper operation of jack water heaters.
4. Integrity of engine cooling and fuel supply systems.
5. Excessive mechanical and electrical noise.
6. Overheating of engine or generator.
7. Proper installation of vibration isolators.
8. Proper cooling liquid type and level.
9. Operate engine-generator and check for:
 - a. Excessive mechanical and electrical noise.
 - b. Overheating.
 - c. Correct rotation.
 - d. Check resistance temperature detectors or generator inherent thermal protectors for functionality and proper operation.
 - e. Excessive vibration.
10. Verify voltage regulator and governor operation will cause unit speed and output voltage to stabilize at proper values within reasonable length of time.
11. Proper operation of meters and instruments.
12. Compare generator nameplate rating and connection with one-line diagram or approved Submittal.
13. Verify engine-generator operation with adjustable frequency drives energized and operating under normal load conditions.

B. Electrical and Mechanical Tests:

1. Cold start test by interrupting normal power source with test load consisting of connected building load to verify:
 - a. Transfer switch operation.
 - b. Automatic starting operation.
 - c. Operating ability of engine-generator.
 - d. Overcurrent devices capability to withstand inrush currents.
2. Phase rotation tests.
3. Test engine protective shutdown features for:
 - a. Low oil pressure.
 - b. Overtemperature.
 - c. Overspeed.

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4. Load bank test with resistors for each load step. Record voltage, frequency, load current, oil pressure, and engine coolant temperature at 15-minute intervals:
 - a. 25 percent applied load for 30 minutes.
 - b. 50 percent applied load for 30 minutes.
 - c. 75 percent applied load for 30 minutes.
 - d. 100 percent applied load for 3 hours.
 - e. Load test results to demonstrate ability of unit to deliver rated load for test period.
5. One-Step Rated kW Load Pickup Test:
 - a. Perform test immediately after performing load bank test.
 - b. Apply rated load, minus largest rated hp motor, to generator.
 - c. Start largest rated horsepower motor and record voltage drop for 20 cycles minimum with high-speed chart recorder or digital storage oscilloscope.
 - d. Compare voltage drop with maximum allowable voltage dip for specified starting situation.

END OF SECTION

SECTION 26 29 23
LOW-VOLTAGE ADJUSTABLE FREQUENCY DRIVE SYSTEM

GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. Electronic Industries Alliance (EIA): 359-A-1, Special Colors.
 2. Hydraulic Institute Standards (HIS).
 3. Institute of Electrical and Electronics Engineers (IEEE):
 - a. 112, Standard Test Procedure for Polyphase Induction Motors and Generators.
 - b. 519, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.
 - c. C62.41, Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
 4. National Electrical Manufacturer's Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1,000 Volts Maximum).
 - b. CP 1, Shunt Capacitors.
 - c. MG 1, Motors and Generators.
 - d. WC 57, Standard for Control, Thermocouple Extensions, and Instrumentation Cables.
 5. National Fire Protection Association (NFPA): 79, Electrical Standard for Industrial Machinery.

1.02 DEFINITIONS

- A. Terms that may be used in this section:
1. AFD: Adjustable frequency drive.
 2. CMOS: Complementary metal oxide semiconductor.
 3. CSI: Current source inverter.
 4. EMU: Energy monitoring unit.
 5. GTO: Gate turn-off thyristor.
 6. MPR: Motor protection relay.
 7. MTBF: Mean time between failure.
 8. PWM: Pulse width modulation.
 9. ROM: Read only memory.
 10. RTD: Resistance temperature detector.
 11. RTU: Remote Telemetry Unit.

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12. Rated Load: Load specified for equipment.
13. Rated Speed: Nominal rated (100 percent) speed specified for equipment.
14. TDD: Total demand distortion.
15. THD: Total harmonic distortion.
16. TTL: Transistor transistor logic.

1.03 SYSTEM DESCRIPTION

A. General:

1. 6-pulse low harmonic VFD.
 - a. VFD shall be normal operation.
 - b. Modbus communication required with existing WTP Master Control Panel.
 - c. Complete system shall be housed in a NEMA-3R enclosure identical to an enclosed 18-pulse VFD/RVSS system of the same I_H rating. Minimum enclosure dimensions as shown on the Drawings.
2. Refer to Plans for Manufacturer and Product Number.

B. Performance Requirements:

1. Composite drive/motor efficiency (CE) is defined as ratio of motor shaft kW to drive input kW. AFD system minimum requirements:
 - a. At 60-Hz drive output and 100 percent load, CE equals 92 percent.
 - b. At 50-Hz drive output and 60 percent load CE equals 89 percent.
 - c. At 40-Hz drive output and 30 percent load CE equals 84 percent.
 - d. At 30-Hz drive output and 12.5 percent load CE equals 77 percent.
2. Rated Continuous Operation Capacity: Not less than 1.15 times full load current rating of driven motor, as indicated on motor nameplate, and suitable for continuous operation at continuous overload which may be imposed on motor by driven pump operating over specified speed range.
3. Normal Source Current Harmonic Distortion: Manufacturer standard for 6-Pulse ultra-low harmonic drives.

C. Design Requirements:

1. Drive system consisting of adjustable frequency controller, drive motor, auxiliary items, and components necessary for complete operating system.
2. Other equipment is being powered from same bus as adjustable frequency drives. Ensure proper operation of drives and other loads under normal and emergency conditions.
3. Furnish AFDs rated on basis of actual motor full load nameplate current rating times the service factor.

4. Drive System: Convert incoming three-phase, 60-Hz ac power to variable voltage, adjustable frequency output for adjustable speed operation of a standard ac induction squirrel-cage motor, using pulse-width-modulation (PWM) technique to produce adjustable frequency output.
5. System rated for continuous industrial duty and suitable for use with NEMA MG 1, Design B motors.
6. Incoming Line Circuit Breaker: Provide positive means of disconnecting incoming power, and overcurrent protection for drive system.
7. Incoming Line Reactor: Design to minimize harmonic distortion on incoming power feeder; 5 percent.
8. Output dv/dt filter.

1.04 SUBMITTALS

A. Action Submittals:

1. Overall drive system operating data, including efficiencies, input currents, and power factors, at driven equipment actual load and rated system input voltage, at 0, 40, 60, 80, 100, and 110 percent of rated speed.
2. Individual and total harmonic content (voltage and current) reflected in system normal source supply at driven equipment actual load at 70 percent and 100 percent of rated speed at the service-entrance equipment.
3. Individual and total current and voltage harmonic content reflected in standby power source, at the service-entrance equipment, at driven equipment actual load at 70 percent and 100 percent of rated speed determined by using actual size and subtransient reactance of standby system obtained from standby source manufacturer.
4. AFD output pulse maximum peak voltage, pulse rise time, and pulse rate of rise including justification for proposed deviation from specified values. Include motor manufacturer's certification motor insulation will withstand long-term overvoltages caused at motor terminals due to specified output pulse data or proposed deviation from this data.
5. Data on shelf life of "dc link" capacitor.
6. Complete system rating, including nameplate data, continuous operation load capability throughout speed range of 0 percent to 120 percent of rated speed.
7. Complete adjustable frequency controller rating coordinated with motor full load nameplate current rating; list controller special features being supplied.
8. Controller, reactor, harmonic filter, and isolating transformer (if applicable) dimensional drawings; information on size and location of space for incoming and outgoing conduit.

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9. Maximum heat dissipation from enclosure.
10. Layout of controller face showing pushbuttons, switches, instruments, and indicating lights.
11. Complete system operating description.
12. Complete system schematic (elementary) wiring diagrams.
13. Complete system interconnection diagrams between controller, drive motor, and related components or controls external to system, including wire numbers and terminal board point identification.
14. One-line diagram of system, including component ratings.
15. Description of diagnostic features being provided.
16. Descriptive literature for control devices such as relays and timers.
17. Itemized bill-of-materials listing system components.

B. Informational Submittals:

1. Statement of Supplier qualifications.
2. Special shipping, storage and protection, and handling instructions.
3. Manufacturer's printed installation instructions.
4. Factory functional test reports.
5. Certified copy of test report for identical motor tested in accordance with NEMA MG 1-12.53a and IEEE 112, Test Method B, showing rated load, rated speed efficiency meeting or exceeding specified values; motors not as specified will be rejected.
6. Field test reports.
7. Suggested spare parts list to maintain equipment in service for period of 1 year and 5 years. Include list of special tools required for checking, testing, parts replacement, and maintenance with current price information.
8. List special tools, materials, and supplies furnished with equipment for use prior to and during startup and for future maintenance.
9. Operation and Maintenance Data: As specified in Section 01 78 23, Operation and Maintenance Data.
10. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 43 33, Manufacturers' Field Services.

1.05 QUALITY ASSURANCE

- A. Supplier: Minimum 5 years' experience in furnishing similar size and type adjustable frequency, controlled speed, drive systems.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Components and accessories specified in this section shall be products of:
 - 1. EATON SVX9000: Refer to Drawings.
- B. No “or-equal” or substitute products will be considered.

2.02 SERVICE CONDITIONS

- A. Ambient Operating Temperature: 25 degrees F to 104 degrees F.
- B. Storage Temperature: Minus 40 degrees F to 158 degrees F.
- C. Humidity: 0 percent to 95 percent relative (noncondensing).
- D. Altitude: 0 foot to 3,300 feet.
- E. Frequency Stability: Plus or minus 0.1 percent of maximum frequency.

2.03 COMPONENTS

- A. Drive Units:
 - 1. Incorporate switching power supply operating from dc bus, to produce PWM output waveform simulating sine wave and providing power loss ride through of 2 milliseconds at full load, full speed.
 - 2. Current-limiting semiconductor fuses for protection of internal power semiconductors.
 - 3. Employ diode bridge rectifier providing constant displacement power factor of 0.95 minimum at all operating speeds and loads.
 - 4. Use transistors for output section, providing a minimum 97 percent drive efficiency at full speed, full load.
 - 5. Employ dc power discharge circuit so that after removal of input power dc link capacitor voltage level will decay below 50 volts dc within 1 minute after de-energizing following NEMA CP 1 and NFPA 79. Design dc link capacitor for a MTBF of 5 years.
 - 6. Operate with open circuited output.
 - 7. Input Voltage: 480V ac plus or minus 10 percent.
 - 8. Output Voltage: 0 to 480V ac, three-phase, 0 to 66-Hz.

9. Maximum peak voltage of PWM AFD output pulse of 1,000 volts, with pulse rise time of not less than 2 microseconds, and maximum rate of rise of 500 volts per microsecond. Maximum frequency of PWM AFD output pulse (carrier) frequency of 3,000-Hz. Should magnitudes of these characteristics be more stressful to motor insulation than specified values, furnish insulation systems on motors suitable for proposed values.
10. Motor Audible Noise Level: When operating throughout speed range of PWM AFD, no more than 3 dBA above that designated in NEMA MG 1 for same motor operated at constant speed with a 60-Hz supply voltage.
11. Short-Time Overload Capacity: 125 percent of rated load in rms current for 1 minute following full load, full speed operation.
12. Equipment Short-Circuit Rating: Suitable for connection to system with maximum source three-phase, bolted fault, short-circuit available of 42,000 amps rms symmetrical at 480V ac.
13. Furnish drives with output dv/dt low-pass filters mounted within equipment enclosure.
14. Furnish drives with 5 percent input reactors mounted within equipment enclosure.
15. Diagnostics: Comprehensive for drive adjustment and troubleshooting:
 - a. Memory battery backup; 100-hour minimum during power loss.
 - b. Status messages will not stop drive from running but will prevent it from starting.
 - c. Fault Condition Messages and History: First fault protection function to be activated, ability to store six successive fault occurrences in order. Minimum faults numerically:
 - 1) Overcurrent (time and instantaneous).
 - 2) Overvoltage.
 - 3) Undervoltage (dc and ac).
 - 4) Overtemperature (drive, motor windings, motor bearing, pump bearing).
 - 5) Serial communication fault.
 - 6) Short-circuit/ground fault (motor and drive).
 - 7) Motor stalled.
 - 8) Semiconductor fault.
 - 9) Microprocessor fault.
 - 10) Single-phase voltage condition.
16. Drive Protection:
 - a. Fast-acting semiconductor fuses.
 - b. Overcurrent, instantaneous overcurrent trip.
 - c. Dc undervoltage protection, 70 percent dropout.
 - d. Dc overvoltage protection, 130 percent pickup.
 - e. Overtemperature, drive, inverter, converter, and dc link components.
 - f. Overtemperature, motor, and pump.
 - g. Single-phase protection.

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- h. Reset overcurrent protection (manual or automatic reset).
 - i. Active current limit/torque limit protection.
 - j. Semiconductor fault protection.
 - k. Short-circuit/ground fault protection.
 - l. Serial communication fault protection.
 - m. Microprocessor fault.
 - n. Surge protection for transient overvoltage (6,000 volts, 80 joule surge, tested per IEEE C62.41).
 - o. Visual display of specific fault conditions.
17. Operational Features:
- a. Use manufacturer's standard unless otherwise indicated.
 - b. Sustained power loss.
 - c. Momentary power loss.
 - d. Power interruption.
 - e. Power loss ride through (0.1 second).
 - f. Start on the fly.
 - g. Electronic motor overload protection.
 - h. Stall protection.
 - i. Slip compensation.
 - j. Automatic restart after power return (ability to enable/disable function).
 - k. Critical frequency lockout (three selectable points minimum, by 1.5-Hz steps in 10-Hz bands, to prevent resonance of system).
 - l. Drive maintenance system software for complete programming and diagnostics.
 - m. Ground fault protection, drive, and motor.
 - n. Operate with no motor connected to output terminals.
- B. Rectifier: Three-phase 6-pulse full wave diode bridge rectifier to provide constant dc voltage to drive's dc bus.
- C. Furnish series choke and capacitors on dc bus to reduce ripple in rectifier output and to reduce harmonic distortion reflected into incoming power feeders.
- D. Controller: Microprocessor-controller PWM inverter to convert to dc voltage to variable voltage, adjustable frequency, three-phase ac output. Output voltage shall vary proportionally with frequency to maintain constant ratio of volts to hertz up to 60-Hz; above 60-Hz, voltage shall remain constant with drive operating in constant horsepower output mode.

E. Enclosure:

1. NEMA 250, Type 3R, freestanding, enclosure, completely front accessible, and hinged doors. Enclosure shall be designed for 18-pulse enclosed drive with bypass RVSS and ATO. Properly sized to dissipate heat generated by controller within limits of specified operating conditions (including ambient temperature and ambient airflow). Minimum enclosure dimensions as shown on the Drawings.
2. Cable termination compartment door interlocked main circuit breaker, defeatable (lockable in the open position), emergency stop pushbutton, alphanumeric keypad and display, and operator's controls.
3. Wire drive from below for power and control wiring.
4. Size forced-ventilation for periodic operation to cool each unit with maximum ambient temperature of 95 degrees F. Furnish redundant fans such that if one fan fails remaining fans furnish adequate ventilation for drive when operating at maximum capacity. Furnish filters on ventilation intakes.
5. Wiring:
 - a. Bundle stranded copper wiring neatly with nylon tie wraps or with continuous plastic spiral binding.
 - b. Label each terminal for permanent identification of leads.
 - c. Identify each wire at each end with imprinted mylar adhesive-back wire markers.
 - d. Incorporate in as-installed wiring diagrams for wire and terminal numbers shown.
 - e. Wiring across door hinge, use 19-strand, NEMA WC 57 Class C stranding looped for proper twist rather than bending at hinge.
 - f. Wire connections internal to panels by crimp-on terminal types.
 - g. For multiple enclosure systems, complete interconnection wiring with gasketed enclosure openings for wiring.
 - h. Multipoint plug receptacles for control wiring crossing equipment shipping splits.
6. Selector switches, indicating lights, potentiometers, instruments, protective devices, and major system components identified by means of mechanically attached, engraved, laminated nameplates.

F. Operator Interface:

1. Controls: Mount drive local control on front door of enclosure and include control switch and membrane type keypad for the following operator functions:
 - a. Start (when in local mode).
 - b. Stop (when in local mode).
 - c. Speed increase (when in local mode).

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- d. Speed decrease (when in local mode).
 - e. Parameter mode selection (recall programmed parameters).
 - f. LOCAL/OFF/REMOTE control selection (in remote, furnish for remote RUN command digital input and speed increase/decrease via remote 4 mA to 20 mA analog signal).
 - g. Fault reset, manual for faults, except loss of ac voltage which is automatic upon return.
 - h. RUN/preset speed.
 - i. Parameter lock, password or key switch lockout of changes to parameters.
 - j. Start disable, key switch or programmed code.
2. Control circuit disconnect shall de-energize circuits in units that are not de-energized by main power disconnect device.
 3. 120 volts, single-phase, 60-Hz circuits for control power and operator controls from internal control power transformer. Furnish power for motor space heaters rated 120 volts.
 4. Arrange component and circuit such that failure of a single component cannot cause cascading failure(s) of other component(s).
 5. Alphanumeric Display: During normal operation and routine test, the following parameters shall be available:
 - a. Motor current (percent of drive rated current).
 - b. Output frequency (Hertz).
 - c. Output voltage.
 - d. Running time.
 - e. Local/remote indicator.
 - f. Status of digital inputs and outputs.
 - g. Analog input and output values.
 - h. Output motor current per leg.
 - i. All test points.
 6. Adjustable Parameters: Set drive operating parameters and indicate in numeric form. Potentiometers may not be used for parameter adjustment. Minimum setup parameters available:
 - a. Frequency range, minimum, maximum.
 - b. Adjustable acceleration/deceleration rate.
 - c. Volts per Hertz (field weakening point).
 - d. Active current limit/torque limit, 0 percent to 140 percent of drive rating.
 - e. Adjustable voltage boost (IR compensation).
 - f. Preset speed (adjustable, preset operating point).
 - g. Provision for adjustment of minimum and maximum pump speed to be furnished as function of 4 mA to 20 mA remote speed signal.

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G. Signal Interface:

1. Digital Input: As shown on the Drawings.
2. Digital Output: As shown on the Drawings.
3. Analog Input: As shown on the Drawings.
4. Analog Output: As shown on the Drawings.
5. Modbus I/O: As shown on the Drawings.

H. Accessories:

1. Equipment Identification Plate: 16-gauge stainless steel with 1/4-inch die-stamped equipment tag number securely mounted in readily visible location.
2. Lifting Lugs: Equipment weighing over 100 pounds.
3. Anchor Bolts: Type 316 stainless steel, sized by equipment manufacturer.
4. Motor Protection Relay (MPR): For each drive include functions within drive system.

2.04 FACTORY FINISHING

- A. Enclosure: As shown on the Drawings.

2.05 SOURCE QUALITY CONTROL

- A. Factory Inspections: Inspect control panels for required construction, electrical connection, and intended function.
- B. Factory Tests and Adjustments: Test all control panels actually furnished.
- C. Record test data for report.
- D. Functional Test: Perform manufacturer's standard, tests in addition to the following:
1. Test diodes, transistors, and GTOs at a thermal level of 125 degrees C.
 2. Test TTL and CMOS chips at 70 degrees C.
 3. Test printed circuit boards while heat cycled to maximum temperature of 65 degrees C.
 4. Test run power sections at maximum 40 degrees C for 12 hours and run with motors for 6 hours.
 5. Test assembled drive at maximum 40 degrees C and full load, full speed for 4 hours.
 6. Test power capacitors and active components.

7. Operate controller with motor throughout its specified range, and at rated power supply load for 1 hour.
8. Resonance: When harmonic filters are furnished to meet specified harmonic distortion requirements, perform analysis and furnish documentary evidence that filter elements do not resonate with remainder of system parameters at harmonic frequencies present.

E. Motor Test: See Section 26 20 00, Low-Voltage AC Induction Motors.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's printed instructions.

3.02 FIELD QUALITY CONTROL

A. Functional Test:

1. Conduct on each controller.
2. Inspect controller for electrical supply termination connections, interconnections, proper installation, and quiet operation.
3. Vibration Test:
 - a. Complete assembly, consisting of motor, load, and flexible shafting, connected and in normal operation shall not develop amplitudes of vibration exceeding limits recommended by HIS.
 - b. Where loads and drives are separated by intermediate flexible shafting, measure vibration both at top motor bearing and at two points on top pump bearing, 90 degrees apart.
4. Record test data for report.

B. Performance Test:

1. Conduct on each controller.
2. Perform under actual or approved simulated operating conditions.
3. Test for continuous 12-hour period without malfunction.
4. Demonstrate performance by operating continuous period while varying application load, as input conditions allow, to verify system performance.
5. With plant load connected to normal utility source, measure and record the:
 - a. Total and individual current harmonic distortion, up to and including 35th harmonic under following load conditions:
 - 1) AFDs running at full load and half load.
 - 2) Half of specified AFDs running at full load and half load.
 - b. Power factor at input side of each drive. Documented verification that power factor is maintained at 95 percent as speed of drive goes down from 100 percent to 33 percent.

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C. Test Equipment:

1. Use Dranetz, Model No. 626-PA, harmonic distortion monitor and Series 626 disturbance analyzer or equivalent instrument to document results.
2. Provide diagnostic plug-in test card complete with instructions, multiposition selector switch, and meters or built-in diagnostic control panel or ROM-based processor for monitoring ac, dc, and digital signals to assist in troubleshooting and startup of drive.

3.03 MANUFACTURERS' SERVICES

A. Manufacturer's Representative: Present at Site for minimum person-days listed below, travel time excluded:

1. 2 person-days for installation assistance and inspection.
2. 2 person-days for functional and performance testing, programming of the VFD, and completion of Manufacturer's Certificate of Proper Installation.
3. 1 person-day for prestartup classroom or Site training.

B. See Section 01 43 33, Manufacturers' Field Services.

END OF SECTION

SECTION 26 32 13.13
DIESEL ENGINE GENERATOR SET

PART 1 GENERAL

1.01 CODES AND STANDARDS

- A. The generator set shall conform to the requirements of the following codes and standards:
1. Drawing G-05, Structural design criteria.
 2. CSA C22.2, No. 14-M91 Industrial Control Equipment.
 3. EN50082-2, Electromagnetic Compatibility-Generic Immunity Requirements, Part 2: Industrial.
 4. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
 5. IEC8528 part 4, Control Systems for Generator Sets.
 6. IEC Std 61000-2 and 61000-3 for susceptibility, 61000-6 radiated and conducted electromagnetic emissions.
 7. IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
 8. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
 9. NFPA 99, Essential Electrical Systems for Health Care Facilities.
 10. NFPA 110, Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit. Component level type tests will not substitute for this requirement.
 11. National Electric Manufacturer's Association (NEMA):
 - a. MG 1, Motors and Generators.
 12. National Electrical Contractors Association (NECA): 404, Recommended Practice for Installing Generator Sets.
 13. SAE International (SAE): J1074, Engine Sound Level Measurement.

1.02 SCOPE OF WORK

- A. SJCUD shall furnish the diesel generator set per the Specifications. It is the intent for the contractor to coordinate, delivery/pickup, installation per the drawings and coordinate equipment start-up and testing with the manufacturer's representative.
- B. The generator set shall be provided on the basis of a turbocharged diesel fueled engine generator set as further described in these Specifications.

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1.03 GENERAL REQUIREMENTS

- A. The generator set will be a commercial design and will be complete with all of the necessary accessories for complete installation as shown on the plans, Drawings, and Specifications herein.
- B. The equipment supplied and installed shall meet the requirements of the National Electrical Code, along with all applicable local codes and regulations.
- C. All equipment shall be new and of current production of a national firm which manufactures the generator and assembles the generator sets as a complete and coordinated system. There will be one source responsibility for warranty, parts, and service through a local representative with factory-trained servicemen.

1.04 SUBMITTALS

- A. Action Submittals:
 - 1. Dimensioned outline drawing showing plan and elevations of engine generator set and drive system.
 - 2. Paragraph by paragraph specification compliance statement, describing differences between specified and proposed equipment.
 - 3. Engine and generator weight, and anchoring requirements.
 - 4. Catalog information and technical description; include materials for block, heads, valves, rings, cylinders, pistons, crankshaft, and major bearings and wear surfaces.
 - 5. Complete list of accessories provided.
 - 6. Performance curves showing engine efficiency (fuel consumed per kWh output), gross fuel consumption rate, and kW output at design rated output, one-half load, and one-quarter load. Account for design altitude, temperature corrections, and engine parasitic loads.
 - 7. Transient and subtransient reactances per unit.
 - 8. Output waveform and telephone interference factor (TIF).
 - 9. Circuit breaker data, including make model, catalog number, settings, and time current curves and enclosure size.
 - 10. Cable termination lug data sheets.
 - 11. Control panel instrument identification inscriptions.
 - 12. Sample guarantee.
 - 13. Electrical schematic and wiring diagrams for the following:
 - a. Generator control panel.
 - b. Main generator.
 - c. Voltage regulator.

- d. Battery charging system.
 - e. Governing system.
 - f. Interconnection wiring diagram identifying by terminal number, each required interconnection between the generator set, the transfer switch, and the SCADA system.
14. Engine generator set motor starting capability and percent voltage dip curve.
 15. Block heater size and voltage.
 16. Jacket water heater size and voltage.
 17. Subbase tank size and dimensions.
 18. Noise data for enclosed engine generator at 50 percent, 75 percent, and full load.
 19. Exhaust system silencer pipe supports.
 20. Anchorage and bracing drawings and cut sheets as required by Section 01 88 15, Anchorage and Bracing.

B. Informational Submittals:

1. Anchorage and bracing calculations as required by Section 01 88 15, Anchorage and Bracing.
2. Calculations and shop drawings for generator enclosure building, stairs, and access platform, including gravity and lateral force resisting system and anchors. Shall be stamped by a qualified engineer registered in the State of Florida.
3. Generator set manufacturer qualifications.
4. Generator set UL 2200 certification documentation or independent certification.
5. Manufacturer's Certificate of compliance with specified EPA emissions requirements in accordance with Section 01 61 00, Common Product Requirements.
6. Certification, copies of analyses, or test reports demonstrating appropriate vibration analysis and design in all modes.
7. Certified Factory Test Report.
8. Operation and Maintenance Data: As specified in Section 01 78 23, Operation and Maintenance Data.
9. Description of parts and service availability.
10. Manufacturer's Certificate of Proper Installation, in accordance with Section 01 43 33, Manufacturers' Field Services.
11. Special guarantee.

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1.05 QUALITY ASSURANCE

- A. Authority Having Jurisdiction (AHJ):
 - 1. Provide Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, provide material and equipment labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ to provide a basis for approval under NEC.
 - 2. Provide materials and equipment manufactured within the scope of standards published by UL in conformance with those standards documented with an applied UL listing mark.
- B. Manufacturer Special Requirements:
 - 1. Generator Set: Listed to UL 2200 or submitted to an independent third party certification process to verify compliance as installed.
 - 2. Generator Set Manufacturer: Certified to ISO 9001 with third party certification verifying quality assurance in design/development, production, installation, and service, in accordance with ISO 9001.
- C. The complete power generation system, including engine, generator, and transfer switch, shall be the product of one manufacturer who has been regularly engaged in the production of complete generating systems for a least 20 years. All components shall have been designed to achieve optimum physical and performance compatibility and prototype tested to prove integrated design capability. The complete system shall have been factory fabricated, assembled, and production tested. The naming of a specific manufacturer does not waive any requirements of this Specification.

1.06 AIR QUALITY PERMIT

- A. Obtain prior to releasing generator for production.

1.07 MINIMUM SERVICE AND WARRANTY QUALIFICATIONS

- A. The manufacturer shall have a local authorized dealer who can provide factory trained servicemen, the required stock of replacement parts, technical assistance, and warranty administration.

1.08 WARRANTY TERMS

- A. The manufacturer's and dealer's extended warranty shall in no event be for a period of less than 2 years from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the jobsite, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Applicable deductible costs shall be specified in the manufacturer's warranty. Running hours shall not be a limiting factor for the system warranty by either the manufacturer or servicing dealer. Submittals received without written warranties as specified will be rejected in their entirety.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Materials and equipment specified in this section shall be products of:
 - 1. Caterpillar.

2.02 GENERAL

- A. The generator shall be Standby Duty rated at 50 KW at 480 volts, 60 Hz., 0.80 power factor Wye connected, 3 phase including radiator fan and all parasitic loads. It shall be sized to operate at the specified load at a maximum ambient of 104 degrees F (40°C) and 1,000 feet above sea level.
- B. Motor starting performance and voltage dip determinations shall be based on the complete generator set. The generator set shall be capable of supplying 181 LRKVA for starting motor loads with a maximum instantaneous voltage dip of 20 percent, as measured by a digital RMS transient recorder in accordance with IEEE standard 115. Motor starting performance and voltage dip determination that does not account for all components affecting total voltage dip i.e. engine, alternator, voltage regulator and governor will not be acceptable.
- C. Engine brake horsepower shall be sufficient to deliver full rated generator set kW/kVA when operated at rated rpm and equipped with all engine-mounted parasitic and external loads such as radiator fan and power generator.
- D. Vibration isolators shall be provided between the engine-generator and heavy-duty steel base.
- E. The generator set shall be sound attenuated to a level suitable for a residential area.

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2.03 ENGINE

- A. The engine shall deliver the required electrical power at a governed speed of 1,800 rpm. The engine shall be equipped with the following:
- B. An electronic isochronous governor capable of plus 0.5 percent steady-state frequency regulation.
- C. 12-Volt positive engagement solenoid shift-starting motor.
- D. 70-Ampere minimum automatic battery charging alternator with solid-state voltage regulation.
- E. Positive displacement, full pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain.
- F. Dry-type replaceable air cleaner elements for normal applications.
- G. Batteries shall be heavy duty SLI lead acid type with battery charger.
- H. Engine-driven or electric fuel-transfer pump including fuel filter and electric solenoid fuel shutoff valve capable of lifting fuel.
- I. The turbocharged, air-cooled engine shall be fueled by diesel.
- J. The engine shall have a minimum of 4 cylinders, and be liquid-cooled by a unit-mounted radiator, blower fan, water pump, and thermostats. This system shall properly cool the engine in an ambient temperature up to 122 degrees F (50°C).
- K. The engine shall be EPA certified from the factory, and shall not require a Site performance test.
- L. Engines shall start, achieve rated voltage, and freeway, and be capable of accepting load within 10 seconds of detected power interruption.

2.04 GENERATOR

- A. The alternator shall be salient-pole, brushless, 2/3-pitch, 12 lead, self-ventilated with drip-proof construction and amortisseur rotor windings and skewed for smooth voltage waveform.
- B. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be a fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to Standby 130 degrees C.

- C. The excitation system shall be of brushless construction controlled by a solid-state voltage regulator capable of maintaining voltage within plus or minus 0.5 percent at any constant load from 0 percent to 100 percent of rating.
- D. The generator set shall meet the transient performance requirements of ISO 8528-5, level G-2.
- E. The generator shall have a single maintenance-free bearing, shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.
- F. The generator shall be inherently capable of sustaining at least 250 percent of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current support devices.

2.05 CONTROLLER

A. Standards:

- 1. The generator must meet NFPA-110 Level 1 requirements (1999 version) and must have an integral alarm horn as required by NFPA.
- 2. NFPA-99 and NEC must also be accommodated.
- 3. The controller shall be UL 508 listed.

B. Applicability:

- 1. For standardization purposes, the control described herein must be available on generator sets 20 kW and larger.
- 2. The controller must be usable on 12- or 24-volt starting systems.
- 3. Environment:
 - a. Minus 40 degrees to degrees plus 70 degrees C operating temperature range.
 - b. 5-95 percent humidity, non-condensing.

C. Hardware Requirements:

- 1. The control shall have a run-off/reset-auto three-position selector switch.
- 2. A controller-mounted, latch-type emergency stop pushbutton.
- 3. Five indicating lights:
 - a. System Ready.
 - b. Not in AUTO.

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- c. Programming Mode.
 - d. System Warning.
 - e. System Shutdown.
 4. Display with two lines of 20 alphanumeric characters viewable in all light conditions.
 5. Snap action sealed keypad for menu selection and data entry.
 6. An audible alarm with alarm silence capability.
 7. Panel lights shall be supplied as standard.
- D. Control Functional Requirements:
1. Field programmable time delay for engine start. Adjustment range, 0-15 minutes in 1 second increments.
 2. Field programmable time delay engine cooldown. Adjustment range, 0-10 minutes in 1-minute increments.
 3. Output for shedding loads if the generator reaches a user programmable percentage of its kW rating. Load shed must also be enabled if the generator output frequency falls below 59 Hz.
 4. Programmable cyclic cranking that allows up to six crank cycles and up to 35 seconds of crank time per crank cycle.
 5. Real-time clock and calendar for time stamping of events.
 6. The control must be capable of detecting the following conditions and display on the control panel:
 - a. Emergency stop.
 - b. High coolant temperature.
 - c. Controller internal fault.
 - d. Low oil pressure.
 - e. Overcrank.
 - f. Overspeed.
 7. Conditions resulting in generator warning (generator will continue to operate):
 - a. Battery charger failure.
 - b. Customer programmed digital auxiliary input.
 - c. Customer programmed analog auxiliary input.
 - d. Power system supplying load.
 - e. High battery voltage.
 - f. High coolant temperature.
 - g. Loss of AC sensing.
 - h. Low battery voltage.
 - i. Low coolant temperature.
 - j. Low fuel level or pressure.
 - k. Low oil pressure.
 - l. Overcurrent.
 - m. Speed sensor fault.
 - n. Weak battery.

E. Control Monitoring Requirements:

1. All monitored functions must be viewable on the digital display.
2. The following generator functions must be monitored:
 - a. All output voltages - single phase, three phase, line to line, and line to neutral, 1.0 percent accuracy.
 - b. All single phase and three phase currents, 1.0 percent accuracy.
 - c. Output frequency, 1.0 accuracy.
3. Engine parameters listed below shall be monitored:
 - a. Coolant temperature.
 - b. Oil pressure.
 - c. Battery voltage.
 - d. RPM.
4. Operational records shall be stored in the control beginning at system startup.
 - a. Run time hours.
 - b. Run time loaded hours.
 - c. Run time unloaded hours.
 - d. Number of starts.
 - e. Last run data including date, duration, and whether loaded or unloaded.
 - f. Run time kilowatt hours.
5. The following operational records shall be a resettable for maintenance purposes:
 - a. Run time hours.
 - b. Run time loaded hours.
 - c. Run time unloaded hours.
 - d. Number of starts.
 - e. Days of operation.
 - f. Run time kilowatt hours.
6. The controller shall store the last one hundred generator set system events with date and time of the event.
7. For maintenance and service purposes, the controller shall store and display on demand the following information:
 - a. Manufacturer's model and serial number.
 - b. Battery voltage.
 - c. Generator set kilowatt rating.
 - d. Rated current.
 - e. System voltage.
 - f. System frequency.
 - g. Number of phases.

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F. Accessories:

1. PLC/SCADA Interface
 - a. Generator set interface to the PLC/SCADA system hardwired I/O shall include:
 - 1) PLC digital input – Generator Run Status.
 - 2) PLC digital input – Generator Fault.
 - 3) PLC digital input – Generator Low Fuel.
2. The generator shall come with a primary, factory installed, 80 percent rated line circuit breaker of 100 amperes that is UL2200 listed. Load side lugs shall be provided from the factory.
3. Engine block heater. Thermostatically controlled and sized to maintain manufacturers recommended engine coolant temperature to meet the start-up requirements of NFPA-99 and NFPA-110, Level 1.
4. Battery Charger. A 10-ampere automatic float to equalize battery charge. The battery charger shall be UL listed.
5. Battery rack, and battery cables, capable of holding the manufacturer's recommended batteries, shall be supplied.
6. Critical Silencer. The engine exhaust silencer shall be temperature and rust resistant, and rated for critical applications. The silencer will reduce total engine exhaust noise by 25-35 db(A).

2.06 GENERATOR WEATHER PROTECTIVE ENCLOSURE

- A. The complete diesel engine generator set, including generator control panel, engine starting batteries and fuel oil tank, shall be enclosed in a factory assembled, weather protective enclosure.
- B. The enclosure must provide security from vandals and be aesthetically pleasing as well. In addition the enclosure must meet applicable National Electric Code (NEC) and National Fire Protection Association (NFPA) codes relating to clearances of all items included with the Generator Set.
- C. The performance of the enclosure must be in accordance with the Generator Set's specific requirements for cooling and combustion airflow.
- D. Clearances must be adequate for maintenance personnel and/or doors must be located such that service personnel have adequate access.
- E. The enclosure will be of Modular construction allowing complete flexibility in design and use. The enclosure must be capable of being modified in the factory or after installation to meet various field conditions.
- F. All enclosures are to be constructed from high strength aluminum.

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- G. The enclosure shall be finish coated with powder baked paint for superior finish, durability and appearance. Enclosures will be finished in the manufacturer's standard color.
- H. The enclosure must be capable of withstanding a 138 mph wind. Intake louvers and enclosure overall must be able to maintain less the .01 ounces of moisture penetration per square foot of louver free area during a 4 inch /hr rainfall.
- I. Lifting provisions must be provided in the base that enable the complete Gen-set with the enclosure to be lifted without damage.
- J. The enclosure roof shall be pitched to prevent accumulation of water. The roof section shall be guttered.
- K. The roof must be capable of supporting the largest commercially available silencer recommended for this particular model Gen-set.
- L. All doors shall be cross-braced to provide the maximum strength possible and to maintain alignment. Door seals are to be rubber material that is non-hydroscopic and will not allow the doors to freeze shut.
- M. Doors must be hinged with stainless steel hinges and hardware and be removable.
- N. Doors shall be equipped with lockable latches. Locks must be keyed alike.
- O. Exhaust silencer(s) shall be mounted above the roof using heavy-duty 7 gauge powder-coated brackets.
- P. The exhaust system shall include a roof penetration section that will eliminate rain or water run-off from entering the enclosure.
- Q. Gas-proof, seamless, stainless steel, flexible exhaust bellows with threaded NPT connection.
- R. Engine crankcase emission canister.
- S. The generator set shall be sound attenuated to a level suitable for a residential area. The generator set shall be provided with a sound attenuated enclosure. The generator set shall also include an exhaust silencing system and an air intake silencing system. The overall sound attenuating enclosure design shall reduce sound levels to a level acceptable in a residential area. With sound level at 23 feet no more than 74 DBA.

2.07 DOUBLE WALL SUB BASE FUEL TANK

- A. Provide a double wall sub-base tank constructed to meet all local codes and requirements. A fuel tank base of 24 hour capacity minimum shall be provided as an integral part of the enclosure. It shall be contained in a rupture basin with 110 percent capacity. A locking fill cap, a mechanical reading fuel level gauge, low fuel level alarm contact, and fuel tank rupture alarm contact shall be provided.
1. The sub base fuel system is listed under UL 142, sub section entitled Special Purpose Tanks EFVT category, and will bear their mark of UL Approval according to their particular classification.
 2. The above ground steel secondary containment rectangular tank for use as a sub base for diesel generators is manufactured and intended to be installed in accordance with the Flammable and Combustible Liquids Code—NFPA 30, the Standard for Installation and Use of Stationary Combustion Engine and Gas Turbines—NFPA 37, and Emergency and Standby Power Systems—NFPA 110.
- B. Construction:
1. Primary Tank: It will be rectangular in shape and constructed in clam shell fashion to ensure maximum structural integrity and allow the use of a full throat fillet weld.
 2. Steel Channel Support System: Reinforced steel box channel for generator support, with a load rating of 5,000 pounds. per gen set mounting hole location. Full height gussets at either end of channel and at gen set mounting holes shall be utilized.
 3. Exterior Finish: The exterior coating has been tested to withstand continuous salt spray testing at 100 percent exposure for 244 hours to a 5 percent salt solution at 92-97 degrees F. The coating has been subjected to full exposure humidity testing to 100 percent humidity at 100 degrees F for 24 hours. Tests are to be conducted in accordance with The American Standard Testing Methods Society.
- C. Venting: Normal venting shall be sized in accordance with the American Petroleum Institute Standard No 2000, Venting Atmospheric and Low Pressure Storage Tanks not less than 1-1/4 inch (3 cm.) nominal inside diameter. A 1 -1/4-inch atmospheric mushroom cap shall be furnished and the installing contractor shall pipe above the highest fill point as a minimum

- D. Emergency Venting: The emergency vent opening shall be sized to accommodate the total capacity of both normal and emergency venting and shall be not less than that derived from NFPA 30, table 2-8, and based on the wetted surface area of the tank. The wetted area of the tank shall be calculated on the basis of 100 percent of the primary tank. A zinc plated emergency pressure relief vent cap shall be furnished for the primary tank. The vent is spring-pressure operated: opening pressure is 0.5/psig and full opening pressure is 2.5 psig. Limits are stamp marked on top of each vent. The emergency relief vent is sized to accommodate the total venting capacity of both normal and emergency vents.
- E. Fuel Fill: There shall be a 2-inch NPT opening within the primary tank with an 8 inch raised fill pipe and lockable manual fill cap.
- F. Fuel Level: A direct reading, UL listed, magnetic fuel level gauge with a hermetically-sealed vacuum tested dial shall be provided to eliminate fogging.
- G. Low Fuel Level Switch: Consists of a 50 watt float switch for remote or local annunciation of a (50% standard) low fuel level condition.

2.08 AUTOMATIC LOAD TRANSFER CONTROL

- A. Provide automatic run controls suitable for remote interface and control by automatic transfer switch. Engine generator set shall start and run upon closure of a remote dry contact provided in Section 26 36 23, Automatic Transfer Switch.

2.09 FACTORY FINISHING

- A. Engine Generator Set and Instrument Panel: Factory-applied primer and two finish coats of manufacturer's standard heat-resistant engine paint.

2.10 FACTORY TESTS

- A. General: Conform to NFPA 110.
- B. Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
 - 1. Single-step load pickup.
 - 2. Transient and steady-state governing.
 - 3. Safety shutdown device testing.
 - 4. Voltage regulation.
 - 5. Rated Power at 0.8 PF.
 - 6. Maximum Power.

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- C. Transient Load Test: Conduct transient load test to demonstrate ability to meet load pickup and load release requirements specified.
- D. Upon request a certified test record will be sent to the customer. Factory test report to include transient response, load/speed stability, engine fuel consumption, power output, and harmonic analysis.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Level and securely mount engine generator set in accordance with manufacturer's recommendations.
- B. Install in accordance with NECA 404.
- C. Where applicable, mount engine generator set on vibration isolators in accordance with isolator manufacturer's recommendations.

3.02 FIELD FINISHING

- A. Touch up damaged coating with paint system compatible to existing.

3.03 FIELD TESTS BY GENERATOR MANUFACTURER

- B. Site Tests: An installation check, start-up, and building load test shall be performed by the manufacturer's local representative. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:
 - 1. Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.
 - 2. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. These shall include: block heaters, battery charger, generator strip heaters, remote annunciator, etc.
 - 3. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and frequency, and phase rotation.

4. Automatic start-up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator voltage, amperes, and frequency shall be monitored throughout the test. An external load bank shall be connected to the system if sufficient station load is unavailable to load the generator to the nameplate kW rating.
5. Site load test shall be 2 to 4 hours at 25, 50, 75, and 100 percent load and Single-step load pickup.

A. Test Report: Record and report the following:

1. Electric load on generator.
2. Fuel consumption.
3. Exhaust temperature.
4. Ambient air temperature.
5. Safety shutdown performance results.
6. Noise levels at 7 meters and at Property line.

B. Post-test Requirements:

1. Make final adjustments.
2. Replace fuel and oil filters.
3. Check belt drive tensions.
4. Demonstrate proper operation of equipment, including automatic operation with control from automatic transfer switch, to Engineer and Owner.

3.04 MANUFACTURER'S SERVICES

A. Manufacturer's Representative: Present at Site or classroom designated by Owner, for minimum person-days listed below, travel time excluded:

1. 1/2 person-day for installation assistance and inspection.
2. 1 person-day for functional and performance testing and completion of Manufacturer's Certificate of Proper Installation.
3. 1/2 person-day for prestartup classroom or Site training.
4. 1 person-day for facility startup.
5. 1 person-day for post-startup training of Owner's personnel. Training shall not commence until an accepted detailed lesson plan for each training activity has been reviewed by Owner.

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- B. See Section 01 43 33, Manufacturers' Field Services and Section 01 91 14, Equipment Testing and Facility Startup.

END OF SECTION

SECTION 26 36 23
AUTOMATIC TRANSFER SWITCHES

PART 1 GENERAL

1.01 REFERENCES

- A. The Automatic Transfer Switches and accessories shall conform to requirements of the following codes and standards:
1. UL 1008 - Standard for Automatic Transfer Switches
 2. NFPA 110 - Emergency and Standby Power Systems
 3. NEMA Standard ICS10-1993 (formerly ICS2-447) - AC Automatic Transfer Switches
 4. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).
 5. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
 6. UL 891 According to this UL standard the equipment shall be labeled: "Suitable for use only as service equipment.
 7. UL 50 - UL Standard for Safety for Enclosures for Electrical Equipment.
 8. UL 508 - UL Standard for Safety for Industrial Control Equipment.
 9. NEMA 250 - Enclosures for Electrical Equipment (1,000 Volts Maximum).

1.02 SCOPE OF WORK

- A. SJCUD shall furnish the automatic transfer switch (ATS) per the specifications. It is the intent for the Contractor to coordinate, delivery/pickup, installation per the drawings and coordinate equipment start-up and testing with the manufacturer's representative. Furnish and install the ATS with number of poles, amperage, voltage, and withstand current ratings as shown on the Drawings. Automatic transfer shall consist of an inherently double throw power transfer switch unit and a microprocessor controller, interconnected to provide complete automatic operation.
- B. The automatic transfer switch ATS manufacturer shall furnish, field test, adjust and certify the installed ATS units for satisfactory operation.
- C. Any exceptions or deviations to this specification shall be indicated in writing and submitted with the quotation.

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1.03 SUBMITTALS

- A. Six copies of approval drawings shall be furnished for Engineer's approval prior to factory assembly of the ATS units. These Drawings shall consist of the following:
1. Elementary power and control wiring diagrams including all power and control components packaged with in the ATS enclosure.
 2. Documentation of any non-default setting programmed at the factory.
 3. Panel layout and front elevation drawings.
 4. Front elevations drawings including dimensions for panel front view, top and bottom conduit entry.
 5. Equipment ratings.
 6. Anchorage and bracing drawings and cut sheets, as required by Section 01 88 15, Anchorage and Bracing.
- B. Informational Submittals:
1. Calculations as required by Section 01 88 15, Anchorage and Bracing.
 2. Manufacturer's Certificate of Compliance, in accordance with Section 01 61 00, Common Product Requirements.
 3. Factory Certified test reports.
 4. Operation and Maintenance Data: As specified in Section 01 78 23, Operation and Maintenance Data.

1.04 QUALITY ASSURANCE

- A. Authority Having Jurisdiction (AHJ):
1. Provide the Work in accordance with NFPA 70, National Electrical Code (NEC). Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval under NEC.
 2. Materials and equipment manufactured within the scope of standards published by UL shall conform to those standards and shall have an applied UL listing mark. A UL label shall be attached inside each unit as verification.
- B. The ATS unit shall be manufactured by one supplier in an ISO 9001 certified facility.
- C. The ATS unit shall be designed, constructed, and tested in accordance with UL, CSA, NEMA & NEC standards and shall be third party certified by UL, CSA and NOM.

- D. The manufacturer of the ATS unit shall have been specialized in the design and production of ATS units for a period of at least 10 years.
- E. The ATS manufacturer shall have a local authorized dealer who can provide factory-trained servicemen, the required stock of replacement parts, technical assistance, and warranty administration.
- F. The ATS unit shall be warranted to be free from defects in materials and workmanship for a period of 18 months from date of shipment by the manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The ATS unit shall be ASCO 7000 Series or prior approved equal. Substitutions must be submitted in writing three (3) weeks prior to original bid date with supporting documentation demonstrating that the alternative manufacturer meets all aspects of the Specifications herein.
- B. Acceptability of an alternate manufacturer shall be determined by the Engineer.

2.02 GENERAL

- A. The controller shall direct the operation of the transfer switch. The controller's sensing and logic shall be controlled by a built-in microprocessor for maximum reliability, minimum maintenance, and inherent serial communications capability. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance.
- B. The controller shall be enclosed with a protective cover and be mounted separate from the transfer switch unit for safety and ease of maintenance. Sensing and control logic shall be provided on printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers.
- C. The controller shall meet or exceed the requirements for Electromagnetic Compatibility (EMC) as follows:
 - 1. ANSI C37.90A/IEEE 472 Voltage Surge Test.
 - 2. NEMA ICS – 109.21 Impulse Withstand Test.
 - 3. IEC801-2 Electrostatic discharge (ESD) immunity.

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4. ENV50140 and IEC 801 – 3 Radiated electromagnetic field immunity.
5. IEC 801 – 4 Electrical fast transient (EFT) immunity.
6. ENV50142: Surge transient immunity.
7. ENV50141: Conducted radio-frequency field immunity.
8. EN55011: Group 1, Class A conducted and radiated emissions.
9. EN61000 –4 – 11 Voltage dips and interruptions immunity.

2.03 ENCLOSURE

- A. Type: NEMA 250, Type 4X with enclosure grounding terminal.
- B. A ground bus shall be provided for connection of the grounding conductor to the system ground.
- C. Control wiring shall be rated for 600 volt, UL 1015. Wires shall be placed in wire duct or harnessed and shall be supported to prevent sagging or breakage from weight or vibration. All wiring to hinged doors shall be run through door terminal blocks or connection plugs.

2.04 ENVIRONMENTAL RATINGS

- A. The ATS unit shall be designed to operate at an ambient temperature from minus 20 degrees C to plus 70 degrees C (-4°F to 158°F).
- B. The storage temperature range shall be minus 40 degrees C to plus 85 degrees° degrees C (-40 degrees F to 185°F).
- C. The ATS unit shall be designed to operate with relative humidity of 5 percent to 95 percent non-condensing.
- D. The ATS unit shall be rated to operate at altitudes less than or equal to 3,300 feet (1,000 m).

2.05 ELECTRICAL RATINGS

- A. The ATS unit shall be designed to operate from an input voltage of 480V ac plus or minus 10 percent.
- B. The ATS unit shall operate from an input voltage frequency range from 57 to 63 Hz.

- C. The ATS shall be rated for 200 amps.
- D. The ATS shall be 3-pole.
- E. Withstand and Closing Ratings - The ATS shall be rated to close on and withstand the 200,000 A rms symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans.

2.06 CONTROL MODULE

- A. Completely enclosed and mounted separately from the transfer switch unit.
- B. Microprocessor for sensing and logic control with inherent digital communications capability.
- C. Plug-in, industrial grade interfacing relays with dust covers.
- D. Connected to transfer switch by wiring harness having keyed disconnect plug.
- E. The voltage of each phase of the normal source shall be monitored, with pickup adjustable to 95 percent of nominal and dropout adjustable from 70 to 90 percent of pickup setting.
- F. Single-phase voltage and frequency sensing of the emergency source shall be provided.
- G. An adjustable time delay shall be provided to override momentary normal source outages and delay all transfer and engine starting signals.
- H. An adjustable time delay shall be provided on transfer to emergency, adjustable from 0 to 5 minutes for controlled timing of transfer of loads to emergency.
- I. An adjustable time delay shall be provided on retransfer to normal, adjustable to 30 minutes. Time delay shall be automatically bypassed if emergency source fails and normal source is acceptable.
- J. A 5-minute cool down time delay shall be provided on shutdown of engine generator.
- K. All adjustable time delays shall be field adjustable without the use of tools.

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- L. A set of gold-flashed contacts rated 10 amps, 32V dc shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.

- M. ATS interface to the SCADA/Telemetry system with hardwired I/O shall include:
 - 1. Transfer Switch Normal.
 - 2. Transfer Switch Emergency.
 - 3. Transfer Switch Utility Source Available.
 - 4. Transfer Switch Emergency Source Available.

- N. Additional Features:
 - 1. A push-button type test switch shall be provided to simulate a normal source failure.
 - 2. A push-button type switch to bypass the time delay on transfer to emergency, the engine exerciser period on the retransfer to normal time delay whichever delay is active at the time the push-button is activated.
 - 3. Auxiliary contacts, rated 10 amps, 250V ac shall be provided consisting of one contact, closed when the ATS is connected to the normal source and one contact, closed, when the ATS is connected to the emergency source.
 - 4. Indicating lights shall be provided, one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red). Also provide indicating lights for both normal and emergency source availability.
 - 5. Terminals shall be provided to indicate actual availability of the normal and emergency sources, as determined by the voltage sensing pickup and dropout settings for each source.
 - 6. In phase Monitor - An In phase monitor shall be inherently built into the controls. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The in phase monitor shall be specifically designed for and be the product of the ATS manufacturer.
 - 7. Programmable Engine Exerciser - A seven or fourteen day programmable engine exerciser with digital readout display. Shall include one form C contact for availability of normal and emergency. Include "with or without" load control switch for exerciser period. The exerciser shall be backed up by a permanent battery.

2.07 FACTORY TESTS

- A. Test to ensure correct:
 - 1. Operation of individual components.
 - 2. Sequence of operation.
 - 3. Transfer time, voltage, frequency, and time delay settings.
- B. Dielectric strength test per NEMA ICS 1.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installation shall be in compliance with manufacturer's instructions, Drawings and recommendations.

3.02 MANUFACTURER'S SERVICES

- A. The ATS unit manufacturer shall provide a factory certified technical representative to supervise the contractor's installation, testing and start-up of the ATS unit(s) furnished under this Specification. Furnish manufacturer's representative in accordance with Section 01 43 33, Manufacturers' Field Services, for the following services at Site, for minimum person-days listed below, travel time excluded:
 - 1. 1 person-day for installation assistance, final adjustment, and initial energization of equipment.
 - 2. 1 person-day for functional and performance testing.
 - 3. 1 person-day for adjustment of relay settings.
- B. Furnish startup services and training of Owner's personnel at such times as requested by Owner.

END OF SECTION

SECTION 26 43 00
SURGE PROTECTIVE DEVICES

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American National Standards Institute (ANSI).
 2. Department of Defense: MIL-STD-220C, Test Method Standard – Method of Insertion Loss Measurement.
 3. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. C62.41.1, IEEE Guide on the Surge Environment in Low-Voltage (1,000 V and less) AC Power Circuits.
 - b. C62.41.2, IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1,000 V and less) AC Power Circuits.
 - c. C62.45, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1,000 V and less) AC Power Circuits.
 4. National Fire Protection Association (NFPA): 70, National Electrical Code (NEC).
 5. UL:
 - a. 497A, Standard for Secondary Protectors for Communications Circuits.
 - b. 1283, Standard for Electromagnetic Interference Filters.
 - c. 1449, Standard for Surge Protective Devices.

1.02 QUALITY ASSURANCE

- A. UL Compliance and Labeling:
1. SPDs for Power and Signal Circuits: Comply with UL 1449 and complimentary listed to UL 1283 as an electromagnetic interference filter. Provide units listed and labeled by UL.
 2. SPDs for Telephone Circuit Protection: Comply with UL 497A.
- B. ANSI Compliance: Use SPD devices in compliance with the recommendations of IEEE C62.41.1, IEEE C62.41.2, and IEEE C62.45.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Eaton, SPD Series.
- B. General Electric, Tranquell.
- C. Square D, Surelogic.
- D. Advanced Protection Technologies, Inc.

2.02 GENERAL

- A. Unless indicated otherwise, provide direct bus-connected and factory-installed SPDs inside distribution equipment.
- B. SPD Operating Conditions: Capable of performing at ambient temperatures between minus 40 degrees C and 60 degrees C, at relative humidity ranging from 0 percent to 95 percent, and at altitudes ranging from sea level to 12,000 feet.
- C. Connect SPDs through a fused switch or circuit breaker as selected by manufacturer. Provide overcurrent protection to allow full surge handling capabilities and afford safety protection from thermal overloads and short circuits.
- D. SPD Short Circuit Current Rating (SCCR): No less than the SCCR of distribution equipment.
- E. Design SPD devices to protect all modes (L-L, L-N, L-G, N-G) of electrical system being used.
- F. Power Filter: Include a high-frequency extended range power filter for each SPD complimentary listed to UL 1283 as an electromagnetic interference filter.
- G. Provide SPDs with the following monitoring and diagnostics:
 - 1. LED-type indication lights to show normal and failed status of each protected phase.
 - 2. Surge event counter.
 - 3. Form C dry contact which operates when unit fails.

- H. Provide UL Type 2 SPDs.
- I. EMI/RFI Noise Suppression: -50dB attenuation at 100 kHz, tested per MIL-STD 220C.
- J. Voltage Protection Rating (VPR):

Voltage Rating	L-N	N-G	L-G	L-L
208Y/120	800	800	800	1200
480Y/277	1200	1200	1200	2000
240 Δ	--	--	1200	1200
480 Δ	--	--	2000	2000

2.03 SERVICE ENTRANCE AND DISTRIBUTION SPD

- A. Provide SPD meeting IEEE C62.41.1 and IEEE C62.41.2 Location in accordance with Category C.
- B. Surge Current Capacity:
 - 1. Service Entrance:
 - a. 200 kA per phase.
 - b. 100 kA per mode.
 - 2. Distribution:
 - a. 120 kA per phase.
 - b. 60 kA per mode.
- C. Maximum Continuous Operating Voltage (MCOV): Not less than 115 percent of nominal system voltage.
- D. Nominal Discharge Current (I_N): 20kA.

2.04 PANELBOARD SPD

- A. Provide SPD meeting IEEE C62.41.1 and IEEE C62.41.2 Location in accordance with Category B.
- B. Surge Current Capacity:
 - 1. Distribution: 120 kA per phase; 60 kA per mode.
 - 2. Branch: 120 kA per phase; 60 kA per mode

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- C. Maximum Continuous Operating Voltage (MCOV): Not less than 125 percent of the nominal system voltage.
- D. Nominal Discharge Current (I_N): 10kA.

2.05 PAIRED CABLE DATA LINE INTERIOR SUPPRESSORS

- A. Provide units meeting IEEE C62.41, Location Category A.
- B. Use bi-polar 1,500-watt silicon avalanche diodes between protected conductor and earth ground.
- C. Provide units with a maximum single impulse current rating of 80 amperes (10 by 1,000 microsecond-waveform).
- D. Breakdown voltage shall not exceed 36 volts.

2.06 PAIRED CABLE DATA LINE EXTERIOR SUPPRESSORS

- A. Provide units meeting IEEE C62.41, Location Category A.
- B. Design Requirements: A hybrid design with a minimum of three stages, using solid-state components and operating bi-directionally.
- C. Meet or exceed the following criteria:
 - 1. Maximum single impulse current rating of 10,000 amperes (8 by 20 microsecond-waveform).
 - 2. Pulse Life Rating: 3,000 amperes (8 by 20 microsecond-waveform); 2,000 occurrences.
 - 3. Maximum clamping voltage at 10,000 amperes (8 by 20 microsecond current waveform), shall not exceed the peak of normal applied signal voltage by 200 percent.

PART 3 EXECUTION

3.01 APPLICATION REQUIREMENTS

- A. Provide SPDs when indicated on Drawings or in the equipment specifications.
- B. Provide factory-installed SPDs as integral components to new switchgear, switchboards, motor control centers, panelboards and transfer switches. Externally mounted SPDs are not acceptable for new distribution equipment.

- C. Externally mounted SPDs are acceptable for SPDs added to existing equipment as described below.
- D. Electronic Equipment Paired Cable Conductors: Install data line suppressors at the low voltage input and output of each piece of equipment, including telephone cable entrance.
 - 1. Use secondary protectors on lines that do not exit the structure.
 - 2. Use primary protectors on lines that exit and enter the structure.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Install suppressors according to manufacturer's recommendations.
- B. Install suppressors directly to the cabinet which houses the circuit to be protected so that the suppressor leads are straight and short, with conductors laced, running directly to the point of connection within the panel, without loops or bends. If bends are unavoidable, no bend may exceed 90 degrees and bending radius may not be less than 6 inches.
- C. Provide connecting wires as short as possible with gently twisted conductors, tied together, to prevent separation.
 - 1. Maximum Length: 24 inches.
- D. Field Installed Conductors: As specified for building wire, not smaller than 8 AWG and not larger than 4 AWG. Provide device leads not longer than the maximum length recommended by manufacturer, unless specifically reviewed and approved by manufacturer.
- E. Provide dedicated disconnecting means for SPD devices installed at main service entrance location, switchgear, and motor control centers. Provide dedicated 30-60-ampere circuit breakers (size dependent upon wire size used) with number of poles as required, as disconnecting means for SPD devices. Provide circuit breakers with interrupting capacity equal to that specified for other breakers at that location.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 GENERAL

1.01 DEFINITIONS

- A. Interfering or Objectionable Material: Trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying; topsoil.
- B. Clearing: Removal of interfering or objectionable material lying on or protruding above ground surface.
- C. Grubbing: Removal of vegetation and other organic matter including stumps, buried logs, and roots greater than 2-inch caliper to a depth of 6-inches below subgrade.
- D. Stripping: Removal of topsoil remaining after applicable clearing and grubbing is completed.
- E. Project Limits: Areas, as shown or specified, within which Work is to be performed.

1.02 SUBMITTALS

- A. Action Submittals: Drawings clearly showing clearing, grubbing, and stripping limits.

1.03 QUALITY ASSURANCE

- A. Obtain Engineer's approval of staked clearing, grubbing, and stripping limits, prior to commencing clearing, grubbing, and stripping.

1.04 SCHEDULING AND SEQUENCING

- A. Prepare Site only after adequate erosion and sediment controls are in place. Limit areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Clear, grub, and strip areas actually needed for Site improvements within limits shown or specified.
- B. Do not injure or deface vegetation that is not designated for removal.

3.02 LIMITS

- A. As follows, but not to extend beyond Project limits.
 - 1. Excavation Excluding Trenches: 5 feet beyond top of cut slopes.
 - 2. Trench Excavation: 4 feet from trench centerline, regardless of actual trench width.
 - 3. Structures: 15 feet outside of new structures.
 - 4. Roadways: Clearing, grubbing and stripping 10 feet from roadway centerline.
- B. Remove rubbish, trash, and junk from entire area within Project limits.

3.03 CLEARING

- A. Clear areas within limits shown or specified.
- B. Fell trees so that they fall away from facilities and vegetation not designated for removal.
- C. Cut stumps not designated for grubbing flush with ground surface.
- D. Cut off shrubs, brush, weeds, and grasses to within 2 inches of ground surface.

3.04 GRUBBING

- A. Grub areas within limits shown or specified.

3.05 STRIPPING

- A. Do not remove topsoil until after clearing and grubbing is completed.
- B. Strip 3 inches of topsoil. Do not remove subsoil with topsoil.
- C. Stockpile strippings, meeting requirements of Section 32 91 13, Soil Preparation, for topsoil, separately from other excavated material.

3.06 TREE REMOVAL OUTSIDE CLEARING LIMITS

- A. Remove Within Project Limits: Dead, dying, leaning, or otherwise unsound trees that may strike and damage Project facilities in falling.
- B. Cut stumps off flush with ground, remove debris, and if disturbed, restore surrounding area to its original condition.

3.07 DISPOSAL

- A. Clearing and Grubbing Debris:
 - 1. Dispose of debris offsite.
 - 2. When onsite burning is not prohibited by federal, state, or local authorities, debris may be burned onsite. Control burning to prevent fire from spreading.
 - 3. During periods when burning is prohibited by federal, state, or local authorities, debris may be stockpiled until burning ban is rescinded, provided stockpiled material does not constitute a fire hazard or interfere with or delay Work. Stockpiled material shall not remain onsite in excess of 30 days.
 - 4. Dispose of unburned and noncombustible debris offsite.
 - 5. Limit offsite disposal of clearing and grubbing debris to locations that are approved by federal, state, and local authorities, and that will not be visible from Project.
- B. Strippings:
 - 1. Dispose of strippings that are unsuitable for topsoil or that exceed quantity required for topsoil offsite.
 - 2. Stockpile topsoil in sufficient quantity to meet Project needs. Dispose of excess strippings as specified for clearing and grubbing.

END OF SECTION

SECTION 31 23 13
SUBGRADE PREPARATION

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Society for Testing and Materials (ASTM):
 - a. D1556, Standard Test Method for Soil In Place By The Sand-Cone Method.
 - b. D1557, Standard Test Method For Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³; 2,700 kN-m/m³).
 - c. D2216, Standard Method for Laboratory Determination of Water (Moisture) Content for Soil And Rock By Mass.
 - d. D2922, Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - e. D3017, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.02 DEFINITIONS

- A. Optimum Moisture Content:
1. Determined in accordance with ASTM Standard specified to determine maximum dry density for relative compaction.
 2. Determine field moisture content on basis of fraction passing 3/4-inch sieve.
- B. Prepared Ground Surface: Ground surface after completion of clearing and grubbing, stripping of topsoil, excavation to grade, and scarification and compaction of subgrade.
- C. Relative Compaction:
1. Ratio, in percent of as compacted field dry density to laboratory maximum dry density as determined in accordance with ASTM D1557.
 2. Apply corrections for oversize material to either as compacted field dry density or maximum dry density.

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- D. Subgrade: Layer of existing soil after completion of clearing, grubbing, stripping of topsoil prior to placement of fill, roadway structure or base for floor slab.
- E. Proof-Rolling: Testing of subgrade by compactive effort to identify areas that will not support the future loading without excessive settlement.

1.03 SEQUENCING AND SCHEDULING

- A. Complete site preparation and excavation, prior to subgrade preparation.

1.04 QUALITY ASSURANCE

- A. Notify Owner when subgrade is ready for compaction or proof-rolling or whenever compaction or proof-rolling is resumed after a period of extended inactivity.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Keep subgrade free of water, debris, and foreign matter during compaction or proof-rolling.
- B. Bring subgrade to proper grade and cross-section and uniformly compact surface.
- C. Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.
- D. Maintain prepared ground surface in finished condition until next course is placed.

3.02 COMPACTION

- A. Under Earthfill: Compact the upper 12 inches of subgrade to minimum of 95 percent relative compaction as determined in accordance with ASTM D1557.
- B. Under Gravel Road: Compact the upper 12 inches of subgrade to minimum of 95 percent relative compaction as determined in accordance with ASTM D1557.

- C. Under Slabs on Grade: Compact the upper 12 inches of subgrade to minimum of 95 percent relative compaction as determined in accordance with ASTM D1557.

3.03 MOISTURE CONDITIONING

- A. Dry Subgrade: Add water, then mix to make moisture content uniform throughout, and within 3 percent of the optimum moisture content as determined by ASTM D1557.
- B. Wet Subgrade: If the moisture content of the subgrade material is more than 3 percent higher than the optimum moisture content, as determined by ASTM D1557, aerate material by blading, discing, harrowing, or other methods, to hasten drying process.

3.04 FIELD DENSITY TEST

- A. The Contractor shall retain an independent soil testing company to determine in-place density and moisture content by any one or combination of the following methods: ASTM D2922, D1556, D2216, D3017, or other methods approved by St. Johns County.
- B. A minimum of one test per every 3,000 square feet of subgrade shall be conducted.

3.05 CORRECTION

- A. Soft or Loose Subgrade:
 - 1. Adjust moisture content and recompact.
 - 2. Over excavate per St. Johns County Standards, latest edition, and replace with suitable material from the excavation, as specified in St. Johns County Standards, latest edition.
- B. Unsuitable Material: Over excavate per St. Johns County Standards, latest edition, and replace with suitable material, as specified.
 - 1. Beneath Slabs-On-Grade: Granular fill.
 - 2. Trenches:
 - a. Unauthorized Overexcavation: Either trench stabilization material or granular pipe base material, as specified in St. Johns County Standards, latest edition.
 - b. Authorized Overexcavation: Trench stabilization material as specified in St. Johns County Standards, latest edition.

END OF SECTION

SECTION 31 23 16
EXCAVATION

PART 1 GENERAL

1.01 QUALITY ASSURANCE

- A. Provide adequate survey control to avoid unauthorized overexcavation.

1.02 WEATHER LIMITATIONS

- A. Material excavated when frozen or when air temperature is less than 32 degrees F shall not be used as fill or backfill until material completely thaws.
- B. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.03 SEQUENCING AND SCHEDULING

- A. Clearing, Grubbing, and Stripping: Complete applicable Work specified in Section 31 10 00, Site Clearing, prior to excavating.
- B. Dewatering: Conform to applicable requirements of Section 31 23 19.01, Dewatering, prior to initiating excavation.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Excavate to lines, grades, and dimensions shown and as necessary to accomplish Work. Excavate to within tolerance of plus or minus 0.1 foot, except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, granular base, topsoil, and similar items, wherever applicable. Trim to neat lines where concrete is to be deposited against earth.
- B. Do not overexcavate without written authorization of Engineer.
- C. Remove or protect obstructions as shown and as specified in Section 01 50 00, Temporary Facilities and Controls, Article Protection of Work and Property.

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3.02 UNCLASSIFIED EXCAVATION

- A. Excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

3.03 TRENCH WIDTH

- A. Minimum Width of Trenches:
 - 1. Single Pipes, Conduits, Direct-Buried Cables, and Duct Banks:
 - a. Less than 4-inch Outside Diameter or Width: 18 inches.
 - b. Greater than 4-inch Outside Diameter or Width: 18 inches greater than outside diameter or width of pipe, conduit, direct-buried cable, or duct bank.
 - 2. Multiple Pipes, Conduits, Cables, or Duct Banks in Single Trench: 18 inches greater than aggregate width of pipes, conduits, cables, duct banks, plus space between.
 - 3. Increase trench widths by thicknesses of sheeting.
- B. Maximum Trench Width: Unlimited, unless otherwise shown or specified, or unless excess width will cause damage to existing facilities, adjacent property, or completed Work.

3.04 STOCKPILING EXCAVATED MATERIAL

- A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.
- B. Confine stockpiles to within easements, rights-of-way, and approved work areas. Do not obstruct roads or streets.
- C. Do not stockpile excavated material adjacent to trenches and other excavations, unless excavation side slopes and excavation support systems are designed, constructed, and maintained for stockpile loads.
- D. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.

3.05 DISPOSAL OF SPOIL

- A. Dispose of excavated materials, which are unsuitable or exceed quantity needed for fill or backfill, offsite.

- B. Dispose of debris resulting from removal of underground offsite.
- C. Dispose of debris resulting from removal of organic matter, trash, refuse, and junk as specified in Section 31 10 00, Site Clearing, for clearing and grubbing debris.

END OF SECTION

**SECTION 31 23 19.01
DEWATERING**

PART 1 GENERAL

1.01 SUBMITTALS

- A. Informational Submittals: Discharge permits.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

- A. Remove and control water during periods when necessary to properly accomplish Work.

3.02 SURFACE WATER CONTROL

- A. See Section 01 50 00, Temporary Facilities and Controls, Article Temporary Controls.
- B. Remove surface runoff controls when no longer needed.

3.03 DEWATERING SYSTEMS

- A. Provide, operate, and maintain dewatering systems of sufficient size and capacity to permit excavation and subsequent construction in dry and to lower and maintain groundwater level a minimum of 2 feet below the lowest point of excavation. Continuously maintain excavations free of water, regardless of source, and until backfilled to final grade.
- B. Design and Operate Dewatering Systems:
 - 1. To prevent loss of ground as water is removed.
 - 2. To avoid inducing settlement or damage to existing facilities, completed Work, or adjacent property.
 - 3. To relieve artesian pressures and resultant uplift of excavation bottom.

3.04 DISPOSAL OF WATER

- A. Obtain discharge permit for water disposal from authorities having jurisdiction.

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- B. Treat water collected by dewatering operations, as required by regulatory agencies, prior to discharge.
- C. Discharge water as required by discharge permit and in manner that will not cause erosion or flooding, or otherwise damage existing facilities, completed Work, or adjacent property.
- D. Remove solids from treatment facilities and perform other maintenance of treatment facilities as necessary to maintain their efficiency.

END OF SECTION

SECTION 31 23 23
FILL AND BACKFILL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. C117, Standard Test Method for Materials Finer Than 75-Micrometers (No. 200) Sieve in Mineral Aggregates by Washing.
 - b. C136, Standard Method for Sieve Analysis of Fine and Coarse Aggregates.
 - c. D75, Standard Practice for Sampling Aggregates.
 - d. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - e. D1556, Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - f. D1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - g. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - h. D4254, Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - i. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 - j. Manual of Water, Wastewater, and Reuse Design Standards and Specifications – St. Johns County Utility Department (SJCUD).

1.02 DEFINITIONS

- A. Relative Compaction: As specified in Section 31 23 13, Subgrade Preparation.
- B. Prepared Ground Surface: Ground surface after completion of required demolition, clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade, and subgrade preparation.

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- C. Completed Course: A course or layer that is ready for next layer or next phase of Work.
- D. Lift: Loose (uncompacted) layer of material.
- E. Well-Graded:
 - 1. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.
 - 2. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.
 - 3. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.
- F. Influence Area: Area within planes sloped downward and outward at 60-degree angle from horizontal measured from:
 - 1. 1 foot outside outermost edge at base of foundations or slabs.
 - 2. 1 foot outside outermost edge at surface of roadways or shoulder.
 - 3. 0.5 foot outside exterior at spring line of pipes or culverts.
- G. Borrow Material: Material from required excavations or from designated borrow areas on or near Site.
- H. Selected Backfill Material: Materials available onsite that Engineer determines to be suitable for specific use.
- I. Imported Material: Materials obtained from sources offsite, suitable for specified use.
- J. Structural Fill: Fill materials as required under structures, pavements, and other facilities.
- K. Embankment Material: Fill materials required to raise existing grade in areas other than under structures.

1.03 SUBMITTALS

- A. Informational Submittals:
 - 1. Manufacturer's data sheets for compaction equipment.
 - 2. Certified test results from independent testing agency.

1.04 QUALITY ASSURANCE

- A. Notify Engineer when:
 - 1. Structure is ready for backfilling, and whenever backfilling operations are resumed after a period of inactivity.
 - 2. Soft or loose subgrade materials are encountered wherever embankment or site fill is to be placed.
 - 3. Fill material appears to be deviating from Specifications.

1.05 SEQUENCING AND SCHEDULING

- A. Complete applicable Work specified in Section 31 23 13, Subgrade Preparation, prior to placing fill or backfill.
- B. Backfill against concrete structures only after concrete has attained compressive strength, specified in Section 03 30 10, Structural Concrete. Obtain Engineer's acceptance of concrete work and attained strength prior to placing backfill.
- C. Do not place granular base, subbase, or surfacing until after subgrade has been prepared as specified in Section 31 23 13, Subgrade Preparation.

PART 2 PRODUCTS

2.01 SOURCE QUALITY CONTROL

- A. Gradation Tests: By Contractor's testing laboratory as necessary, to locate acceptable sources of imported material.

2.02 EARTHFILL

- A. Excavated material from required excavations free from rocks larger than 3 inches, from roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.
- B. Material containing more than 10 percent gravel, stones, or shale particles is unacceptable.
- C. Provide imported material of equivalent quality, if required to accomplish Work.

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2.03 GRANULAR FILL

- A. Sand or sand with silt classified as SP or SP-SM in accordance with the Unified Soil Classification System (ASTM D2487).

2.04 WATER FOR MOISTURE CONDITIONING

- A. Free of hazardous or toxic contaminants, or contaminants deleterious to proper compaction.

2.05 TOPSOIL

- A. General: Natural, friable, sandy loam, obtained from well-drained areas, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.

PART 3 EXECUTION

3.01 GENERAL

- A. Keep placement surfaces free of water, debris, and foreign material during placement and compaction of fill and backfill materials.
- B. Place and spread fill and backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specified densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grades or as necessary to keep placement surfaces drained of water.
- C. During filling and backfilling, keep level of fill and backfill around each structure even.
- D. Tolerances:
 - 1. Final Lines and Grades: Within a tolerance of 0.1 foot unless dimensions or grades are shown or specified otherwise.
 - 2. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.
- E. Settlement: Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping, and other facilities, caused by settlement of fill or backfill material.

3.02 BACKFILL UNDER AND AROUND STRUCTURES

- A. Under Facilities: Within influence area beneath structures, slabs, pavements, curbs, piping, conduits, duct banks, and other facilities, backfill with granular fill, unless otherwise shown. Place granular fill in lifts of 6-inch maximum thickness and compact each lift to minimum of 95 percent relative compaction in accordance with ASTM D1557.
- B. Other Areas: Backfill with earthfill to lines and grades shown, with proper allowance for topsoil thickness where shown. Place in lifts of 6-inch maximum thickness and compact each lift to minimum 95 percent relative compaction in accordance with ASTM D1557.

3.03 FILL

- A. Outside Influence Areas beneath Structures, Tanks, Pavements, Curbs, Slabs, Piping, and Other Facilities: Unless otherwise shown, place earthfill as follows:
 - 1. Allow for 6-inch thickness of topsoil where required.
 - 2. Maximum 8-inch thick lifts.
 - 3. Place and compact fill across full width of embankment.
 - 4. Compact to minimum 90 percent relative compaction in accordance with ASTM D1557.
 - 5. Dress completed embankment with allowance for topsoil, crest surfacing, and slope protection, where applicable.

3.04 SITE TESTING

- A. Gradation:
 - 1. As necessary and at such frequency for testing agency to determine suitability of material placed.
 - 2. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.
 - 3. Remove material placed in Work that does not meet Specification requirements.
- B. In-Place Density Tests: In accordance with SJCUD.

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3.05 REPLACING OVEREXCAVATED MATERIAL

- A. Replace excavation carried below grade lines shown or established by Engineer as follows:
1. Beneath Footings: Granular fill.
 2. Beneath Fill or Backfill: Same material as specified for overlying fill or backfill.
 3. Beneath Slabs-On-Grade: Granular fill.

END OF SECTION

SECTION 31 23 23.15
TRENCH BACKFILL

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Public Works Association (APWA): Uniform Color Code.
 2. ASTM International (ASTM):
 - a. C33/C33M, Standard Specification for Concrete Aggregates.
 - b. C94/C94M, Standard Specification for Ready-Mixed Concrete.
 - c. C117, Standard Test Method for Materials Finer than 75 Micrometer (No. 200) Sieve in Mineral Aggregates by Washing.
 - d. C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - e. C150/C150M, Standard Specification for Portland Cement.
 - f. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - g. C1012/C1012M, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.
 - h. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
 - i. D1140, Standard Test Methods for Amount of Material in Soils Finer than No. 200 (75 micrometer) Sieve.
 - j. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 - k. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - l. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
 - m. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - n. D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - o. D4832, Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
 3. National Electrical Manufacturers Association (NEMA): Z535.1, Safety Colors.

1.02 DEFINITIONS

- A. Base Rock: Granular material upon which manhole bases and other structures are placed.
- B. Bedding Material: Granular material upon which pipes, conduits, cables, or duct banks are placed.
- C. Imported Material: Material obtained by Contractor from source(s) offsite.
- D. Lift: Loose (uncompacted) layer of material.
- E. Pipe Zone: Backfill zone that includes full trench width and extends from prepared trench bottom to an upper limit above top outside surface of pipe, conduit, cable or duct bank.
- F. Prepared Trench Bottom: Graded trench bottom after excavation and installation of stabilization material, if required, but before installation of bedding material.
- G. Relative Compaction: The ratio, in percent, of the as-compacted field dry density to the laboratory maximum dry density as determined by ASTM D1557. Corrections for oversize material may be applied to either as-compacted field dry density or maximum dry density, as determined by Engineer.
- H. Relative Density: As defined by ASTM D4253 and ASTM D4254.
- I. Selected Backfill Material: Material available onsite that Engineer determines to be suitable for a specific use.
- J. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes producing a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids. Satisfying both of the following requirements, as defined in ASTM D2487:
 - 1. Coefficient of Curvature: Greater than or equal to 1 and less than or equal to 3.
 - 2. Coefficient of Uniformity: Greater than or equal to 4 for materials classified as gravel, and greater than or equal to 6 for materials classified as sand.

1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings: Manufacturer’s descriptive literature for marking tapes.

B. Informational Submittals:

1. Catalog and manufacturer’s data sheets for compaction equipment.
2. Certified Gradation Analysis: Submit not less than 30 days prior to delivery for imported materials or anticipated use for excavated materials, except for trench stabilization material that will be submitted prior to material delivery to Site.

PART 2 PRODUCTS

2.01 MARKING TAPE

A. Nondetectable:

1. Inert polyethylene, impervious to known alkalis, acids, chemical reagents, and solvents likely to be encountered in soil.
2. Thickness: Minimum 5 mils.
3. Width: 6 inches.
4. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
5. Manufacturers and Products:
 - a. Reef Industries; Terra Tape.
 - b. Mutual Industries; Non-detectable Tape.
 - c. Presco; Non-detectable Tape.

B. Color: In accordance with APWA Uniform Color Code.

Color*	Facility
Red	Electric power lines, cables, conduit, and lightning cables
Orange	Communicating alarm or signal lines, cables, or conduit
Yellow	Gas, oil, steam, petroleum, or gaseous materials
Green	Sewers and drain lines
Blue	Potable water
Purple	Reclaimed water, irrigation, and slurry lines
*As specified in NEMA Z535.1, Safety Color Code.	

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2.02 TRENCH STABILIZATION MATERIAL

A. Granular Backfill:

1. Clean gravel or crushed rock, reasonably well-graded from coarse to fine.
2. Maximum Particle Size: 1-inch.
3. Dry sand, as specified as Granular Fill in Section 31 23 23, Fill and Backfill and as accepted by Engineer, may be provided for trenches above maximum groundwater level.

2.03 BEDDING MATERIAL AND PIPE ZONE MATERIAL

A. Granular Fill: As specified in Section 31 23 23, Fill and Backfill.

2.04 EARTH BACKFILL

A. Earthfill: As specified in Section 31 23 23, Fill and Backfill.

2.05 GRAVEL SURFACING ROCK

A. As specified in Section 32 11 23, Crushed Concrete Surfacing.

2.06 TOPSOIL

A. As specified in Section 32 91 13, Soil Preparation.

2.07 SOURCE QUALITY CONTROL

A. Perform gradation analysis in accordance with ASTM C136 for:

1. Earth backfill, including specified class.
2. Trench stabilization material.
3. Bedding and pipe zone material.

PART 3 EXECUTION

3.01 TRENCH PREPARATION

A. Water Control:

1. As specified in Section 31 23 19.01, Dewatering.
2. Remove water in a manner that minimizes soil erosion from trench sides and bottom.
3. Provide continuous water control until trench backfill is complete.

- B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

3.02 TRENCH BOTTOM

- A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.
- B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify Engineer. Engineer will determine depth of overexcavation, if any required.

3.03 TRENCH STABILIZATION MATERIAL INSTALLATION

- A. Rebuild over excavated trench bottom with trench stabilization material.
- B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.
- C. Compact each lift so as to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts.

3.04 BEDDING

- A. Furnish imported bedding material where, in the opinion of Engineer, excavated material is unsuitable for bedding or insufficient in quantity.
- B. Place over full width of prepared trench bottom in two equal lifts when required depth exceeds 8 inches.
- C. Hand grade and compact each lift to provide a firm, unyielding surface.
- D. Minimum Thickness: As follows:
 - 1. Pipe 16 Inches and Smaller: 4 inches.
 - 2. Conduit: 3 inches.
 - 3. Direct-Buried Cable: 3 inches.
 - 4. Duct Banks: 3 inches.
- E. Check grade and correct irregularities in bedding material. Loosen top 1 inch to 2 inches of compacted bedding material with a rake or by other means to provide a cushion before laying each section of pipe, conduit, direct-buried cable, or duct bank.

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- F. Install to form continuous and uniform support except at bell holes, if applicable, or minor disturbances resulting from removal of lifting tackle.
- G. Bell or Coupling Holes: Excavate in bedding at each joint to permit proper assembly and inspection of joint and to provide uniform bearing along barrel of pipe or conduit.

3.05 BACKFILL PIPE ZONE

- A. Upper limit of pipe zone shall not be less than following:
 - 1. Pipe: 12 inches, unless shown otherwise.
 - 2. Conduit: 3 inches, unless shown otherwise.
 - 3. Direct-Buried Cable: 3 inches, unless shown otherwise.
 - 4. Duct Bank: 3 inches, unless shown otherwise.
- B. Restrain pipe, conduit, cables, and duct banks as necessary to prevent their movement during backfill operations.
- C. Place material simultaneously in lifts on both sides of pipe and, if applicable, between pipes, conduit, cables, and duct banks installed in same trench.
 - 1. Pipe 10-Inch and Smaller Diameter: First lift less than or equal to 1/2 pipe diameter.
 - 2. Pipe Over 10-Inch Diameter: Maximum 6-inch lifts.
- D. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by “walking in” and slicing material under haunches with a shovel to ensure voids are completely filled before placing each succeeding lift.
- E. Each lift shall be compacted to at least 95 percent relative compaction (ASTM D1557) with a minimum of two passes by a vibratory plate compactor. Take care to avoid damaging pipe and pipe coating.

3.06 MARKING TAPE INSTALLATION

- A. Continuously install marking tape along centerline of buried piping. Coordinate with piping installation drawings.
 - 1. Nondetectable Marking Tape: Install with metallic piping.

3.07 BACKFILL ABOVE PIPE ZONE

A. General:

1. Process excavated material to meet specified gradation requirements.
2. Adjust moisture content as necessary to obtain specified compaction.
3. Do not allow backfill to free fall into trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2 feet of backfill has been provided over top of pipe.
4. Do not use power driven impact type compactors for compaction until at least 4 feet of backfill is placed over top of pipe.
5. Backfill to grade with proper allowances for topsoil, crushed rock surfacing, and pavement thicknesses, wherever applicable.
6. Backfill around structures with same class backfill as specified for adjacent trench, unless otherwise shown or specified.

B. Backfill:

1. Backfill for Areas Outside of Facilities: Backfill trench above pipe zone with earth backfill in lifts not exceeding thickness of 8 inches. Mechanically compact each lift to a minimum of 90 percent relative compaction (ASTM D1557) prior to placing succeeding lifts.
2. Backfill for Areas Under and Around Facilities and Power Pole Anchors: Backfill trench above pipe zone with granular fill in lifts not to exceed 6 inches. Mechanically compact each lift to a minimum of 95 percent relative compaction (ASTM D1557) prior to placing succeeding lifts.

3.08 REPLACEMENT OF TOPSOIL

- A. Replace topsoil in top 3 inches of backfilled trench.
- B. Maintain finished grade of topsoil even with adjacent area and grade as necessary to restore drainage.

3.09 MAINTENANCE OF TRENCH BACKFILL

- A. After each section of trench is backfilled, maintain surface of backfilled trench even with adjacent ground surface until final surface restoration is completed.
- B. Gravel Surfacing Rock: Add gravel surfacing rock where applicable and as necessary to keep surface of backfilled trench even with adjacent ground surface, and grade and compact as necessary to keep surface of backfilled trenches smooth, free from ruts and potholes, and suitable for normal traffic flow.

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- C. Topsoil: Add topsoil where applicable and as necessary to maintain surface of backfilled trench level with adjacent ground surface.
- D. Other Areas: Add excavated material where applicable and keep surface of backfilled trench level with adjacent ground surface.

3.10 SITE TESTING

A. Granular Fill and Pipe Zone Fill Gradation:

- 1. One sample from each 100 tons of finished product or more often as determined by Engineer, if variation in gradation is occurring, or if material appears to depart from Specifications.
- 2. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.
- 3. Remove material placed in Work that does not meet Specification requirements.

B. In-Place Density Tests: In accordance with ASTM D 2922. During placement of materials, test as follows:

- 1. Granular Fill and Pipe Zone Fill: One test for every 300 feet of each lift; or one test per lift, whichever requires more tests.
- 2. Earth Backfill: One test every 1,000 cubic yards.

3.11 SETTLEMENT OF BACKFILL

- A. Settlement of trench backfill, or of fill, or facilities constructed over trench backfill will be considered a result of defective compaction of trench backfill.

END OF SECTION

SECTION 32 11 23
CRUSHED CONCRETE SURFACING

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. T11, Standard Method of Test for Materials Finer Than 75 μ m (No. 200) Sieve in Mineral Aggregates by Washing.
 - b. T27, Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates.
 - c. T89, Standard Specification for Determining the Liquid Limit of Soils.
 - d. T90, Standard Specification for Determining the Plastic Limit and Plasticity Index of Soils.
 - e. T96, Standard Specification for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - f. T99, Standard Specification for the Moisture-Density Relations of Soils Using a 2.5 kg (5.5 pound) Rammer and a 305 mm (12 in) Drop.
 - g. T180, Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18-in) Drop.
 - h. T190, Standard Specification for Resistance R-Value and Expansion Pressure of Compacted Soils.
 - i. T265, Standard Method of Test for Laboratory Determination of Moisture Content of Soils.
 - j. T310, Standard Specification for In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
 2. ASTM International (ASTM):
 - a. C88, Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
 - b. D1883, Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

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- c. D2419, Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- d. D4791, Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

1.02 DEFINITIONS

- A. Completed Course: Compacted, unyielding, free from irregularities, with smooth, tight, even surface, true to grade, line, and cross-section.
- B. Completed Lift: Compacted with uniform cross-section thickness.
- C. Standard Specifications: When referenced in this section, shall mean State of Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

1.03 SUBMITTALS

- A. Informational Submittals:
 - 1. Certified Test Results on Source Materials: Submit copies from commercial testing laboratory 20 days prior to delivery of materials to Project showing materials meeting the physical qualities specified.
 - 2. Certified results of in-place density tests from independent testing agency.

PART 2 PRODUCTS

2.01 CRUSHED CONCRETE SURFACING

- A. As specified in Section 911 of the Standard Specifications for Recycled Concrete Aggregate (RCA).

2.02 SOURCE QUALITY CONTROL

- A. Perform tests necessary to locate acceptable source of materials meeting specified requirements.
- B. Final approval of aggregate material will be based on test results of installed materials.
- C. Should separation of coarse from fine materials occur during processing or stockpiling, immediately change methods of handling materials to correct uniformity in grading.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

- A. As specified in Section 160 of the Standard Specifications.
- B. Obtain Engineer's acceptance of subgrade before placing base course or surfacing material.
- C. Do not place base course or surfacing materials on soft, muddy, subgrade.

3.02 EQUIPMENT

- A. In accordance with Section 200 of the Standard Specifications.

3.03 HAULING AND SPREADING

- A. In accordance with Section 200 of the Standard Specifications.

3.04 CONSTRUCTION OF COURSES

- A. Construction of Courses: In accordance with Section 200 of the Standard Specifications.

3.05 ROLLING AND COMPACTION

- A. In accordance with Section 200-6 of the Standard Specifications.

3.06 SURFACE TOLERANCES

- A. Blade or otherwise work surfacing as necessary to maintain grade and cross-section at all times, and to keep surface smooth and thoroughly compacted.
- B. Crushed Concrete Surfacing: Within 0.04 foot from lower edge of 10-foot straightedge placed on finished surface, parallel to centerline.

3.07 FIELD QUALITY CONTROL

- A. In-Place Density Tests: In accordance with Section 200-7 of the Standard Specifications.

3.08 CLEANING

- A. Remove excess material from the Work area. Clean stockpile and staging areas of all excess aggregate.

END OF SECTION

**SECTION 32 91 13
SOIL PREPARATION**

PART 1 GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. ASTM International (ASTM):
 - a. C33/C33M, Standard Specification for Concrete Aggregates.
 - b. C602, Standard Specification for Agricultural Liming Materials.
 - c. D2974, Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils.
 - d. D5268, Standard Specification for Topsoil Used for Landscaping Purposes.

1.02 SEQUENCING AND SCHEDULING

- A. Rough grade areas to be planted or seeded prior to performing Work specified under this section.

PART 2 PRODUCTS

2.01 TOPSOIL

- A. General: Natural, friable, sandy loam, obtained from well-drained areas, free from objects larger than 1-1/2 inches maximum dimension, and free of subsoil, roots, grass, other foreign matter, hazardous or toxic substances, and deleterious material that may be harmful to plant growth or may hinder grading, planting, or maintenance.
- B. Source: Stockpile material onsite, in accordance with Section 31 10 00, Site Clearing.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

- A. Scarify subgrade to minimum depth of 6 inches where topsoil is to be placed.
- B. Remove stones over 2-1/2 inches in any dimension, sticks, roots, rubbish, and other extraneous material.
- C. Limit preparation to areas which will receive topsoil within 2 days after preparation.

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3.02 TOPSOIL PLACEMENT

- A. Do not place topsoil when subsoil or topsoil is frozen, excessively wet, or otherwise detrimental to the Work.
- B. Place topsoil to depth 12 inches within wetlands and 3 inches in other areas where seeding and planting are scheduled.
- C. Uniformly distribute to within 1/2 inch of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade.
- D. Remove stones exceeding 1-1/2-inch diameter, roots, sticks, debris, and foreign matter during and after topsoil placement.
- E. Remove surplus subsoil and topsoil from Site. Grade stockpile area as necessary and place in condition acceptable for planting or seeding.

END OF SECTION

SECTION 32 92 00
TURF AND GRASSES

PART 1 GENERAL

1.01 DEFINITIONS

- A. Maintenance Period: Begin maintenance immediately after each area is planted (seed) and continue for a period of 8 weeks after all planting under this section is completed.
- B. Satisfactory Stand: Grass or section of grass of 10,000 square feet or larger that has:
 - 1. No bare spots larger than 3 square feet.
 - 2. Not more than 10 percent of total area with bare spots larger than 1 square foot.
 - 3. Not more than 15 percent of total area with bare spots larger than 6 square inches.

1.02 SUBMITTALS

- A. Action Submittals: Product labels/data sheets.
- B. Informational Submittals:
 - 1. Seed: Certification of seed analysis, germination rate, and inoculation:
 - a. Certify that each lot of seed has been tested by a testing laboratory certified in seed testing, within 6 months of date of delivery.
Include with certification:
 - 1) Name and address of laboratory.
 - 2) Date of test.
 - 3) Lot number for each seed specified.
 - 4) Test Results: (i) name, (ii) percentages of purity and of germination, and (iii) weed content for each kind of seed furnished.
 - b. Mixtures: Proportions of each kind of seed.
 - 2. Seed Inoculant Certification: Bacteria prepared specifically for legume species to be inoculated.
 - 3. Description of required maintenance activities and activity frequency.

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1.03 DELIVERY, STORAGE, AND PROTECTION

- A. Seed:
 - 1. Furnish in standard containers with seed name, lot number, net weight, percentages of purity, germination, and hard seed and maximum weed seed content, clearly marked for each container of seed.
 - 2. Keep dry during storage.
- B. Hydroseeding Mulch: Mark package of wood fiber mulch to show air dry weight.

1.04 WEATHER RESTRICTIONS

- A. Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.05 SEQUENCING AND SCHEDULING

- A. Prepare topsoil as specified in Section 32 91 13, Soil Preparation, before starting Work of this section.
- B. Complete Work under this section within 3 days following completion of soil preparation.
- C. Notify Engineer at least 3 days in advance of:
 - 1. Each material delivery.
 - 2. Start of planting activity.
- D. Planting Season: Those times of year that are normal for such Work as determined by accepted local practice.

1.06 MAINTENANCE SERVICE

- A. Contractor: Perform maintenance operations during maintenance period to include:
 - 1. Watering: Keep surface moist.
 - 2. Washouts: Repair by filling with topsoil, seeding, and mulching.
 - 3. Mulch: Replace wherever and whenever washed or blown away.
 - 4. Mowing: Mow to 2 inches after grass height reaches 3 inches, and mow to maintain grass height from exceeding 3-1/2 inches.
 - 5. Reseed unsatisfactory areas or portions thereof immediately at the end of the maintenance period if a satisfactory stand has not been produced.
 - 6. Reseed/replant entire area if satisfactory stand does not.

PART 2 PRODUCTS

2.01 SEED

- A. In accordance with Section 981 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.
- B. Summer Seed: Bahia.
- C. Winter Protective Seed: Annual ryegrass.

2.02 STRAW MULCH

- A. Threshed straw of oats, wheat, barley, or rye, free from (i) seed of noxious weeds or (ii) clean salt hay.

2.03 HYDROSEEDING MULCH

- A. Wood Cellulose Fiber Mulch:
 - 1. Specially processed wood fiber containing no growth or germination inhibiting factors.
 - 2. Dyed a suitable color to facilitate inspection of material placement.
 - 3. Manufactured such that after addition and agitation in slurry tanks with water, the material fibers will become uniformly suspended to form homogenous slurry.
 - 4. When hydraulically sprayed on ground, material will allow absorption and percolation of moisture.

PART 3 EXECUTION

3.01 PREPARATION

- A. Grade areas to smooth, even surface with loose, uniformly fine texture.
 - 1. Roll and rake, remove ridges, fill depressions to meet finish grades.
 - 2. Limit such Work to areas to be planted within immediate future.
 - 3. Remove debris, and stones larger than 1-1/2-inch diameter, and other objects that may interfere with planting and maintenance operations.
- B. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface to dry off before seeding. Do not create muddy soil.
- C. Restore prepared areas to specified condition if eroded or otherwise disturbed after preparation and before planting.

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3.02 SEEDING

- A. Start within 2 days of preparation completion.
- B. Mechanical: Broadcast seed in two different directions, compact seeded area with cultipacter or roller.
 - 1. Sow seed at uniform rate per manufacturer's recommendations.
 - 2. Use Brillion type seeder.
 - 3. Broadcasting will be allowed only in areas too small to use Brillion type seeder. Where seed is broadcast, increase seeding rate 20 percent.
 - 4. Roll with ring roller to cover seed, and water with fine spray.
- C. Hydroseeding:
 - 1. Application Rate: Per manufacturer's recommendations.
 - 2. Apply on moist soil, only after free surface water has drained away.
 - 3. Prevent drift and displacement of mixture into other areas.
 - 4. Upon application, allow absorption and percolation of moisture into ground.
- D. Mulching: Apply uniform cover of straw mulch at a rate of 2 tons per acre or wood fiber mulch at rate of 1,500 pounds per acre.
- E. Water: Apply with fine spray after mulching to saturate top 4 inches of soil.

3.03 FIELD QUALITY CONTROL

- A. 8 weeks after seeding is complete and on written notice from Contractor, Engineer will, within 15 days of receipt, determine if a satisfactory stand has been established.
- B. If a satisfactory stand has not been established, Engineer will make another determination after written notice from Contractor following the next growing season.

END OF SECTION

**SECTION 40 27 01
PIPING-GENERAL**

PART 1 GENERAL

1.01 GENERAL

- A. All piping shall conform to St. Johns County Utility Department Standards and these Contract Documents. Except as authorized by the Project Director, in case of conflicts between these contract documents and St. Johns County Utility Department's Manual of Water, Wastewater, and Reuse Design Standards and Specifications, the stricter standard or Specification shall apply.

1.02 DESIGN REQUIREMENTS

- A. Thrust Restraints: All wellhead joint and fittings shall be restrained as shown on the Drawings.

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. Shop Fabricated Piping:
 - a. Detailed pipe fabrication or spool drawings showing special fittings and bends, dimensions, coatings, and other pertinent information.
 - b. Layout drawing showing location of each pipe section and each special length; number or otherwise designate laying sequence on each piece.
 - 2. Pipe Wall Thickness: Identify wall thickness and rational method or standard applied to determine wall thickness for each size of each different service including exposed, submerged, buried, and concrete-encased installations for Contractor-designed piping.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. In Accordance with Owner's Standards:
 - 1. Flanges: Securely attach metal, hardboard, or wood protectors over entire gasket surface.
 - 2. Threaded or Socket Welding Ends: Fit with metal, wood, or plastic plugs or caps.
 - 3. Linings and Coatings: Prevent excessive drying.

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4. Cold Weather Storage: Locate products to prevent coating from freezing to ground.
5. Handling: Use heavy canvas or nylon slings to lift pipe and fittings.

PART 2 PRODUCTS

2.01 PIPING

- A. As specified on Piping Data Sheet(s), located at the end of this section as Supplement and as shown on the Drawings.
- B. Diameters Shown:
 1. Standardized Products: Nominal size.

2.02 JOINTS

- A. Flanged Joints:
 1. Flat-faced carbon steel or alloy flanges when mating with flat-faced cast or ductile iron flanges.
 2. Higher pressure rated flanges as required to mate with equipment when equipment flange is of higher pressure rating than required for piping.
- B. Threaded Joints: NPT taper pipe threads in accordance with ANSI B1.20.1.

2.03 GASKET LUBRICANT

- A. Lubricant shall be supplied by pipe manufacturer and no substitute or “or-equal” will be allowed.

2.04 SERVICE SADDLES

- A. Service saddles are required on all pipe taps.
- B. Ferrous Metal Piping (Except Stainless Steel):
 1. Double-band design rated 150 psi minimum working pressure.
 2. Run diameter compatible with the outside diameter of the pipe on which the saddle is installed.
 3. Taps with iron pipe threads.

4. Materials:
 - a. Body: Ductile Iron ASTM A536.
 - b. Bands: Stainless steel Type 304.
 - c. Hex Nuts and Washers: Stainless steel Type 304.
 - d. Seal: EDPM Rubber.
5. Manufacturers and Models:
 - a. Ford FC202.
 - b. Or Owner-approved equal.

2.05 COUPLINGS

A. General:

1. Coupling linings for use in potable water systems shall be in conformance with NSF 61.
2. Couplings shall be rated for working pressure not less than indicated in Piping Schedule for the service and not less than 150 psi.
3. Couplings shall be lined and coated with fusion-bonded epoxy in accordance with AWWA C213.
4. Unless thrust restraint is provided by other means, couplings shall be harnessed in accordance with requirements of AWWA Manual M11 or as shown on Drawings.

B. Flanged Coupling Adapter:

1. Anchor studs where required for thrust restraint.
2. Manufacturers and Products:
 - a. Ductile Iron Pipe:
 - 1) Dresser Piping Specialties.
 - 2) Smith-Blair, Inc.
 - 3) Or Owner-approved equal.

2.06 FABRICATION

- A. Flanged pipe shall be fabricated in the shop, not in the field, and delivered to the site with flanges in place and properly faced. Threaded flanges shall be individually fitted and machine tightened on matching threaded pipe by the manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify size, material, joint types, elevation, horizontal location, and pipe service of existing pipelines to be connected to new pipelines or new equipment.
- B. Inspect size and location of structure penetrations to verify adequacy of wall pipes, sleeves, and other openings.
- C. Welding Electrodes: Verify proper grade and type, free of moisture and dampness, and coating is undamaged.

3.02 PREPARATION

- A. Inspect pipe and fittings before installation, clean ends thoroughly, and remove foreign matter and dirt from inside.
- B. Damaged Coatings and Linings: Repair using original coating and lining materials in accordance with manufacturer's instructions.

3.03 INSTALLATION-GENERAL

- A. Join pipe and fittings in accordance with manufacturer's instructions, unless otherwise shown or specified.
- B. Remove foreign objects prior to assembly and installation.
- C. Flanged Joints:
 - 1. Install perpendicular to pipe centerline.
 - 2. Bolt Holes: Straddle vertical centerlines, aligned with connecting equipment flanges or as shown.
 - 3. Use torque-limiting wrenches to ensure uniform bearing and proper bolt tightness.
 - 4. Plastic Flanges: Install annular ring filler gasket at joints of raised-face flange.
 - 5. Raised-Face Flanges: Use flat-face flange when joining with flat-faced ductile or cast iron flange.

D. Threaded and Coupled Joints:

1. Conform with ANSI B1.20.1.
2. Produce sufficient thread length to ensure full engagement when screwed home in fittings.
3. Countersink pipe ends, ream and clean chips and burrs after threading.
4. Make connections with not more than three threads exposed.
5. Lubricate male threads only with thread lubricant or tape as specified on Piping Data Sheets.

E. Couplings:

1. General:
 - a. Install in accordance with manufacturer's written instructions.
 - b. Before coupling, clean pipe holdback area of oil, scale, rust, and dirt.
 - c. Remove pipe coating if necessary to present smooth surface.
2. Application:
 - a. Metallic Piping Systems: Flexible couplings, transition couplings, and flanged coupling adapters.

F. Ductile Iron, Cement-Lined Ductile Iron Piping:

1. Cutting Pipe: Cut pipe with milling type cutter, rolling pipe cutter, or abrasive saw cutter. Do not flame cut.
2. Dressing Cut Ends:
 - a. General: As required for the type of joint to be made.
 - b. Rubber Gasketed Joints: Remove sharp edges or projections.
 - c. Push-On Joints: Bevel, as recommended by pipe manufacturer.

3.04 INSTALLATION-EXPOSED PIPING

A. Piping Runs:

1. Parallel to building or column lines and perpendicular to floor, unless shown otherwise.
2. Piping upstream and downstream of flow measuring devices shall provide straight lengths as required for accurate flow measurement.

B. Unions or Flanges: Provide at each piping connection to equipment or instrumentation on equipment side of each block valve to facilitate installation and removal.

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- C. Install piping so that no load or movement in excess of that stipulated by equipment manufacturer will be imposed upon equipment connection; install to allow for contraction and expansion without stressing pipe, joints, or connected equipment.

3.05 THRUST RESTRAINT

- A. A restrained joint table is provided in the Drawings.

3.06 PRESSURE TESTING AND FLUSHING

A. General:

- 1. Pressure and leakage test shall be done in accordance to the following:
 - a. St. Johns County Utility Department Standards, Section 3.9.1, Pressure and Leakage Testing or Pressurized Piping.
 - b. AWWA C-600.
- 2. The Owner or the Owner's representative shall monitor and approve a satisfactory test.

B. Flushing:

- 1. A flushing plan must be approved by the Owner prior to any flushing activities. The Owner's representative shall be present during flushing activities.
- 2. As specified in St. Johns County Utility Department Standards, Section 3.9.3, Disinfection of Water Mains (PVC and Ductile Iron).

3.07 DISINFECTION

A. SUBMITTALS

- 1. Informational Submittals:
 - a. Procedures and plans for disinfection and testing.
 - b. Training records for employees working with concentrated chlorine solutions or gas.
 - c. Type of disinfecting solution and method of preparation.
 - d. Method of disposal for highly chlorinated disinfecting water.

B. General:

1. Before being placed into service, all new water mains shall be chlorinated in accordance with:
 - a. AWWA C-651 Standard Procedure for Disinfecting Water Mains.
 - b. Chapter 62-555 of the FAC.
 - c. St. Johns County Utility Department Standards Section 3.9.3, Disinfection of Water Mains (PVC and Ductile Iron).
2. Prior to placing any new water main into service, a Certificate of Completion shall be obtained by FDEP in accordance with Chapter 62-555.

3.08 FIELD FINISHING

- A. As specified in Section 09 90 00, Painting.

3.09 SUPPLEMENTS

- A. Supplements listed below, following “END OF SECTION,” are part of this Specification.

1. Data Sheets.

<u>Number</u>	<u>Title</u>
-01	Cement-Mortar Lined Ductile Iron Pipe and Fittings
-08	Stainless Steel Pipe and Fittings – General Service

END OF SECTION

SECTION 40 27 01.01 CEMENT-MORTAR LINED DUCTILE IRON PIPE AND FITTINGS	
Item	Description
Pipe	<p>Per SJCUD Standards and Specifications Section 3.10.2</p> <p>Exposed Pipe Using Flange Joints: AWWA C115/A21.15, and AWWA C151/A21.51</p> <p>Pressure Rating:</p> <ul style="list-style-type: none"> a. 4-inch through 12-inch: Pressure Class 350 b. 16-inch through 20-inch: Pressure Class 250 c. 24-inch: Pressure Class 200 d. 30-inch through 64-inch: Pressure Class 150
Lining	Cement-Mortar: AWWA C104/A21.4-90. NSF61 Approved.
Coating	Standard – Asphaltic, one mil thick per AWWA 151.
Fittings	<p>Lined and coated same as pipe. NSF 61 Approved.</p> <p>Flange: AWWA C110/A21.10 and ANSI B16.1, ductile or gray cast iron, faced and drilled, 125-pound flat face or 250-pound raised face. Gray cast iron will not be allowed.</p>
Joints	<p>Above Ground:</p> <p>Flange: 125-pound flat face, 250-pound raised face, ductile iron, threaded conforming to AWWA C115/A21.15. Gray cast iron will not be allowed.</p> <p>Buried:</p> <p>Push-on: Bell and spigot, gasketed per AWWA C111.</p> <p>Mechanical Joint: Material assembly and bolting per AWWA C111. All glands shall be made of ductile iron only.</p> <p>Restrainers:</p> <p>Harness Type Restraint: Ductile iron per AWWA C111 and ASTM A 536 as manufactured by EBBA-Iron and Uni-Flange.</p> <p>Proprietary Joint Restraint Gasket: Stainless steel locking segments vulcanized into the rubber gasket per AWWA C11/ANSI A21.11.</p>

SECTION 40 27 01.01 CEMENT-MORTAR LINED DUCTILE IRON PIPE AND FITTINGS	
Item	Description
Bolting	Mechanical and Proprietary Restrained: Manufacturer's Standards.
Gaskets	Flanged, Water and Sewage Service: 1/8-inch thick, cloth-inserted rubber conforming to ANSI B16.21 and AWWA C207, corrosive acid and alkali free for potable water and sewage service, full face for 125-pound flat-faced flanges, nylon reinforced flat ring type for 250-pound raised-face flanges. Gasket pressure rating to equal or exceed the system hydrostatic test pressure.
Joint Lubricant	Per Manufacturer's standard.

END OF SECTION

SECTION 40 27 01.08 STAINLESS STEEL PIPE AND FITTINGS-GENERAL SERVICE		
Item	Size	Description
Pipe	2 inch & smaller	Schedule 40S: ASTM A312/A312M, Type 316 seamless, pickled and passivated.
Joints	2 inch & smaller	Threaded or flanged at equipment as required or shown.
Fittings	2 inch & smaller	Threaded Forged: 1,000 CWP, ASTM A182/A182M Rev C Grade F316L.
Branch Connections	2 inch & smaller	Tee or reducing tee in conformance with Fittings above.
Flanges	All	Forged Stainless Steel: ASTM A182/A182M Rev C Grade F316L, ANSI B16.5 Class 150 or Class 300, slip-on weld neck or raised face. Cast Carbon Steel: ASTM A216/A216M Grade WCA, drilled, ANSI B16.5 Class 150 or Class 300 Van Stone Type with stainless steel stub ends, ASTM A240 Type 316L "as-welded grade," conforming to MSS-SP43, wall thickness same as pipe.
Unions	2 inch & smaller	Threaded Forged: ASTM A182/A182M Rev C Grade F316, 2,000-pound or 3,000-pound WOG, integral ground seats, AAR design meeting the requirements of ANSI B16.11, bore to match pipe.
Bolting	All	Forged Flanges: Type 316 stainless steel, ASTM A320/A320M Grade B8M hex head bolts and ASTM A194/A194M Grade 8M hex head nuts. Van Stone Flanges: Carbon steel ASTM A307 Grade B hex head bolts and ASTM A563 Grade A hex head nuts. Provide same on mating cast iron flange on valve or equipment with flat ring gasket.

SECTION 40 27 01.08 STAINLESS STEEL PIPE AND FITTINGS-GENERAL SERVICE		
Item	Size	Description
Gaskets	All Flanges	Flanged, Water and Sewage Service: 1/8-inch thick, unless otherwise specified, red rubber (SBR), hardness 80 (Shore A), rated to 200 degrees F, conforming to ANSI B16.21, AWWA C207, and ASTM D1330, Grades 1 and 2. Blind flanges shall be gasketed covering the entire inside face with the gasket cemented to the blind flange.
Thread Lubricant	2 inch & smaller	Teflon tape.

END OF SECTION

SECTION 40 27 02
VALVES AND OPERATORS

PART 1 GENERAL

1.01 GENERAL

- A. All valving shall conform to St. Johns County Utility Department Standards and these Contract Documents. Except as authorized by the Project Director, in case of conflicts between these Contract Documents and St. Johns County Utility Department's Manual of Water, Wastewater, and Reuse Design Standards and Specifications, the stricter standard or Specification shall apply.

1.02 SUBMITTALS

- A. Shop Drawings:
1. Product data sheets for make and model.
 2. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
 3. Open/close and throttle actuators sizing calculations.
- B. Quality Control Submittals:
1. Certificate of Compliance for butterfly valves; full compliance with AWWA C504.
 2. Tests and inspection data.
 3. Manufacturer's Certificate of Proper Installation.
 4. Operation and maintenance manual.

PART 2 PRODUCTS

2.01 GENERAL

- A. Valve to include operator, actuator, handwheel, chain wheel, extension stem, floor stand, worm and gear operator, operating nut, chain, wrench, and accessories for a complete operation.
- B. Valve to be suitable for intended service. Renewable parts not to be of a lower quality than specified.
- C. Valve same size as adjoining pipe.
- D. Valve ends to suit adjacent piping.

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- E. Size operator to operate valve for the full range of pressures and velocities.
- F. Valve to open by turning counterclockwise.
- G. Factory mount operator, actuator, and accessories.

2.02 MATERIALS

- A. Brass and bronze valve components and accessories that have surfaces in contact with water to be alloys containing less than 16 percent zinc and 2 percent aluminum.
- B. Approved Alloys are of the Following ASTM Designations:
 - 1. B61, B62, B98 (Alloy UNS No. C65100, C65500, or C66100), B139 (Alloy UNS No. C51000), B584 (Alloy UNS No. C90300 or C94700), B164, B194, and B127.
 - 2. Stainless steel Alloy 18-8 may be substituted for bronze.

2.03 FACTORY FINISHING

- A. Epoxy Lining and Coating:
 - 1. In accordance with AWWA C550 unless otherwise specified.
 - 2. Either two-part liquid material or heat-activated (fusion) material except only heat-activated material if specified as “fusion” or “fusion bonded” epoxy.
 - 3. Minimum 7-mil dry film thickness except where limited by valve operating tolerances.
- B. Exposed Valves:
 - 1. In accordance with Section 09 90 00, Painting.
 - 2. Safety isolation valves and lockout valves with handles, handwheels, or chain wheels “safety yellow.”

2.04 VALVES

- A. Gate Valves:
 - 1. General:
 - a. AWWA gate valves to be in full compliance with stated AWWA standard and the following requirements:
 - 1) Provide 2-inch operating nut and handwheel for AWWA gate valves 12 inches and smaller.

- 2) Provide Affidavit of Compliance per the applicable AWWA standard for AWWA gate valves.
 - 3) Mark AWWA gate valves with manufacturer's name or mark, year of valve casting, valve size, and working water pressure.
 - 4) Repaired AWWA gate valves shall not be submitted or supplied.
 - 5) Supply AWWA gate valves with stainless steel bolting.
2. Resilient Seated Gate Valve:
- a. Valve body shall be constructed of ductile iron conforming to ASTM A-536 or cast iron per ASTM A126, Class B.
 - b. UL Listed, , resilient seat, bronze mounted, ANSI Class 125 mechanical joint ends with corrosion resistant alloy steel or stainless steel nuts and bolts, nonrising stem, 2-inch operating nut, in accordance with AWWA C509, design working water pressure 200 psig, full port, fusion-epoxy coated inside and outside per AWWA C550, NSF 61 certified.
 - c. Valve disc shall be constructed of Ni-Resist, Type 1 or ductile iron, ASTM A536, Grade 65-45-12 with stainless steel seating edges or cast iron ASTM A126.
 - d. Valve shaft shall be "Stub Shaft" type or one piece extending full size through the disc bearings and shall be constructed of ASTM A276, Type 304 stainless steel or high tensile steel with stainless steel shaft journals.
 - e. Valve seat shall be of a natural rubber or a synthetic rubber compound. Valve shall have bonded mechanically restrained seats molded in, vulcanized, and bonded into the valve body and meet ASTM D429, Method B.
 - f. Manufacturers and Products: Mueller; P-2360.

B. Butterfly Valves:

1. Butterfly Valve- General: Butterfly valve specified as AWWA C504 to be in compliance with AWWA C504 and have the following requirements:
 - a. Suitable for throttling operations and infrequent operation after periods of inactivity.
 - b. Elastomer seats bonded or vulcanized to body shall have adhesive integrity of bond between seat and body assured by testing with minimum 75 pound pull in accordance with ASTM D429, Method B.
 - c. Bubble tight with rated pressure applied from either side.
 - d. No travel stops for the disc on interior of the body.
 - e. Self adjusting V type or O-ring shaft seals.

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- f. Isolate metal to metal thrust bearing surfaces from flowstream.
 - g. Valve body shall be constructed of ductile iron conforming to ASTM A536 or cast iron conforming to ASTM A126, Class B.
 - h. Above ground valves shall be flanged in accordance with ANSI B16.1, Class 125.
 - i. Flanged joints shall have hot-dip galvanized or stainless steel nuts, bolts and washers.
 - j. Body thickness shall be in accordance with AWWA C504.
 - k. Valve seats shall be of natural rubber or synthetic rubber compound.
 - l. Valves 24 inches and smaller shall have bonded mechanically restrained seats molded in vulcanized, and bonded into the valve body.
2. Manufacturers and Products:
- a. Mueller 3211-6, Flanged Ends Class 125.
 - b. Or Owner-approved equal.
- C. Check Valve:
- 1. Slanting Disc Check Valve: Slanting or tilting disc design, off-center pivot, body ductile iron two-piece design, bronze seat on 55-degree angle, disc bronze or ductile iron, pivot pin and bushing Type 304 stainless steel, Class 125, 150 psi rating, Class 125 flange drilling, valve disc position indicator. Provide limit switches as per paragraph ACCESSORIES in this section.
 - a. Manufacturers and Products:
 - 1) Val Matic; Series 9800.
 - 2) Or Owner-approved equal.
- D. Stainless Steel Ball Valves (2 Inches and Smaller):
- 1. Ball valves 2 inches in diameter and smaller shall be 3-piece, full port and stainless steel body construction. Ball valves 2-1/2 inches in diameter shall have reduced port with 3-piece stainless steel body construction. Valve shall have threaded ends and a lever operator as shown on the Drawings. Ball shall be Type 316 stainless steel with TFE seats and packing. Valve shall be pressure rated for 1,000 psi.
 - 2. Ball valves shall be manufactured by Watts Series S, Apollo Series 85 and 86, or Neles-Jamesbury Series 4000.

E. Self-Contained Automatic Valves:

1. Air and Vacuum Valve for Well Service:
 - a. 1/2 inch through 3 inches equipped with stainless steel diffuser screen to break up solid water column before coming in contact with float, 150 SWP angle pattern globe valve with lock shield in the NPT outlet for throttling.
 - b. Rated 150 psi working pressure, cast iron, ductile iron, or semisteel body, cover with stainless steel float and trim.
 - c. Manufacturers and Products:
 - 1) Well Casing Flange: Val-Matic Valve, 1-inch, Model VM22.9DISV
 - 2) Well Discharge: Val-Matic Valve, 2-inch, Model VM38.2DISV
 - 3) Or Owner-approved equal.

2.05 OPERATORS

A. Manual Operator:

1. General:
 - a. Operator force not to exceed 40 pounds under any operating condition, including initial breakaway. Gear reduction operator when force exceeds 40 pounds.
 - b. Operator self-locking type or equipped with self-locking device.
 - c. Position indicator on quarter-turn valves.
 - d. Worm and gear operators one-piece design worm-gears of gear bronze material. Worm hardened alloy steel with thread ground and polished. Traveling nut type operators threader steel reach rods with internally threaded bronze or ductile iron nut.
2. Exposed Operator:
 - a. Galvanized and painted handwheels.
 - b. Lever operators allowed on quarter-turn valves 8 inches and smaller.
 - c. Cranks on gear type operators.
 - d. Valve handles to take a padlock, and wheels a chain and padlock.

2.06 ACCESSORIES

- A. Tagging: 1-1/2 inch diameter heavy brass or stainless steel tag for each valve operator, bearing the valve tag number shown on the Drawings.

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B. Limit Switch:

1. Installed on all raw water production well check valves.
2. Factory installed limit switch to be Square D No. 9007C5482; HA-2 or HA-6 with 5/8-inch roller.

PART 3 EXECUTION

3.01 INSTALLATION

A. Flange Ends:

1. Flanged valve boltholes shall straddle vertical centerline of pipe.
2. Clean flanged faces, insert gasket and bolts, and tighten nuts progressively and uniformly.

B. Screwed Ends:

1. Clean threads by wire brushing or swabbing.
2. Apply joint compound.

C. Valve Orientation:

1. Install operating stem vertical when valve is installed in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above finished floor, unless otherwise shown.
2. Install operating stem horizontal in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above finish floor, unless otherwise shown.
3. Orient butterfly valve shaft so that unbalanced flows or eddies are equally divided to each half of the disc, i.e., shaft is in the plane of rotation of the eddy.

D. Install a line size ball valve and union upstream of each solenoid valve, in-line flow switch, or other in-line electrical device, excluding magnetic flowmeters, for isolation during maintenance.

E. Locate valve to provide accessibility for control and maintenance. Install access doors in finished walls and plaster ceilings for valve access.

3.02 TESTS AND INSPECTION

A. Valve may be either tested while testing pipelines, or as a separate step.

- B. Test that valves open and close smoothly with operating pressure on one side and atmospheric pressure on the other, in both directions for two-way valve and applications.
- C. Inspect air and vacuum valves as pipe is being filled to verify venting and seating is fully functional.
- D. Count and record number of turns to open and close valve; account for any discrepancies with manufacturer's data.
- E. Set, verify, and record set pressures for all relief and regulating valves.
- F. Test hydrostatic relief valve seating; record leakage, adjust and retest to minimum leakage of 0.1 gpm per foot of seat periphery.

END OF SECTION

SECTION 40 90 01
PROCESS INSTRUMENTATION AND CONTROL SYSTEMS (PICS)

PART 1 GENERAL

1.01 SUMMARY

- A. Contractor is responsible for providing timely coordination with Owner, so as to maintain Project Schedule.
- B. Work Includes:
 - 1. Installing, calibrating, adjusting, testing, documenting, and starting up for all Installing Contractor furnished equipment to makeup a complete Process Instrumentation and Control System for the well site.
 - a. Installing Contractor furnished items includes one (1) SCADA panel and well pump instrumentation including primary elements, transmitters, and control devices.
 - b. Testing: Installing Contractor shall perform testing as specified.
 - 2. Furnishing, installing, calibrating, adjusting, testing, documenting, starting up well instrumentation including primary elements, transmitters, and control devices. See Drawings for additional information.
 - a. Testing: Installing Contractor shall perform testing as specified.
 - 3. Coordination with SJCUD to ensure instrumentation and control panel components meet current SJCUD standards.
 - 4. Additional well control functions and requirements are described in the Specifications and Drawings found in Volumes 1 of the Contract Documents.
- C. Detailed Design: PICS as shown and specified includes functional and performance requirements and component specifications. Complete detailed PICS design.

1.02 DEFINITIONS

- A. Signal Types:
 - 1. Analog Signals, Current Type:
 - a. 4 to 20 mA dc signals conforming to ISA S50.1.
 - b. Unless otherwise indicated for specific PICS Subsystem components, use the following ISA 50.1 options:
 - 1) Transmitter Type: Number 2, two-wire.
 - 2) Transmitter Load Resistance Capacity: Class L.
 - 3) Fully isolated transmitters and receivers.

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2. Analog Signals, Voltage Type: 1 to 5 volts dc within panels where a common high precision dropping resistor is used.
3. Discrete signals, two-state logic signals using dc or 120V ac sources as indicated.
4. Pulse Frequency Signals:
 - a. Direct current pulses whose repetition rate is linearly proportional to process variable.
 - b. Pulses generated by contact closures or solid state switches as indicated.
 - c. Power source less than 30V dc.
5. Special Signals: Other types of signals used to transmit analog and digital information between field elements, transmitters, receivers, controllers, and digital devices.

B. Instrument Tag Numbers:

1. A shorthand tag number notation is used in the Loop Specifications. For example: RID AI-1-2(2)(3)[pH]

<u>Notation</u>	<u>Explanation</u>
ID	Site Designator – (Coordinate specific Site Designator with SJCUD)
I	Unit Process Number
AI	ISA designator for Analysis Indicator
2	Loop number
(2)	First unit number; number of same component types in a given loop; -1 and -2 in this example
(3)	Second unit number; number of same component types with same first unit number in a given loop; -1, -2, and -3 in this example
[pH]	Same notation shown at 2 o'clock position on ISA circle symbol on P&ID

2. In this Example, RID1AI-1-12(2)(3)[pH] is Shorthand for:

RID 1AI-1-12-1-1[pH], RID 1AI-1-12-1-2[pH], RID 1AI-1-12-1-3[pH]
RID 1AI-1-12-2-1[pH], RID 1AI-1-12-2-2[pH], RID 1AI-1-12-2-3[pH]

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Provide site and warehouse storage facilities for PICS equipment.
- B. Prior to installation, store items in dry indoor locations. Provide heating in storage areas for items subject to corrosion under damp conditions.
- C. Cover panels and other elements that are exposed to dusty construction environments.

1.04 SEQUENCING AND SCHEDULING

- A. Activity Completion: The following is a list of key activities and their completion criteria:
 - 1. Hardware Delivery: Hardware delivered to Site.
 - 2. Performance Acceptance Test (PAT): Completed and required test documentation accepted.
- B. PICS Substantial Completion: When Owner issues Certificate of Substantial Completion.
 - 1. Prerequisites:
 - a. PICS has successfully completed PAT.
 - b. All spares, expendables, and test equipment have been delivered to Owner.
- C. PICS Acceptance: When Owner issues a written notice of Final Payment and Acceptance.
 - 1. Prerequisites:
 - a. Certificate of Substantial Completion issued for PICS.
 - b. Punch-list items completed.

PART 2 PRODUCTS

2.01 ELECTRICAL REQUIREMENTS

- A. In accordance with Division 26, Electrical, as specified in the Drawings.
- B. I&C and Electrical Components, Terminals, Wires, and Enclosures: UL recognized or UL listed.

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- C. Wires within Enclosures:
 - 1. AC Circuits:
 - a. Type: 300-volt, Type MTW stranded copper.
 - b. Size: For current to be carried, but not less than No. 18 AWG.
 - 2. Analog Signal Circuits:
 - a. Type: 300-volt stranded copper, twisted shielded pairs.
 - b. Size: No. 18 AWG, minimum.
 - 3. Other dc Circuits.
 - a. Type: 300-volt, Type MTW stranded copper.
 - b. Size: For current carried, but not less than No. 18 AWG.
 - 4. Special Signal Circuits: Use manufacturer's standard cables.
 - 5. Wire Identification: Numbered and tagged at each termination.
 - a. Wire Tags: Snap-on or slip-on PVC wire markers with legible machine printed markings and numbers. Adhesive or taped-on tags are not acceptable.
- D. Wires entering or leaving enclosures, terminate and identify as follows:
 - 1. Analog and discrete signal, terminate at numbered terminal blocks.
 - 2. Special signals, terminated using manufacturer's standard connectors.
 - 3. Identify wiring in accordance with Section 26 05 04, Conductors.
- E. Terminal Blocks for Enclosures:
 - 1. Quantity:
 - a. Accommodate present and spare indicated needs.
 - b. Wire spare PLC I/O points to terminal blocks.
 - c. One wire per terminal for field wires entering enclosures.
 - d. Maximum of two wires per terminal for No. 18 AWG wire for internal enclosure wiring.
 - e. Spare Terminals: 20 percent of all connected terminals, but not less than 10 per terminal block.
 - 2. General:
 - a. Connection Type: Screw compression clamp.
 - b. Compression Clamp:
 - 1) Complies with DIN-VDE 0611.
 - 2) Hardened steel clamp with transversal grooves that penetrate wire strands providing a vibration-proof connection.
 - 3) Guides strands of wire into terminal.
 - c. Screws: Hardened steel, captive and self-locking.
 - d. Current Bar: Copper or treated brass.

- e. Insulation:
 - 1) Thermoplastic rated for minus 55 to plus 110 degree C.
 - 2) Two funneled shaped inputs to facilitate wire entry.
- f. Mounting:
 - 1) Standard DIN rail.
 - 2) Terminal block can be extracted from an assembly without displacing adjacent blocks.
 - 3) End Stops: Minimum of one at each end of rail.
- g. Wire preparation: Stripping only permitted.
- h. Jumpers: Allow jumper installation without loss of space on terminal or rail.
- i. Marking System:
 - 1) Terminal number shown on both sides of terminal block
 - 2) Allow use of preprinted and field marked tags.
 - 3) Terminal strip numbers shown on end stops.
 - 4) Mark terminal block and terminal strip numbers as shown on Panel Control Diagrams and Loop Diagrams.
 - 5) Fuse Marking for Fused Terminal Blocks: Fuse voltage and amperage rating shown on top of terminal block.
- j. Test Plugs: Soldered connections for 18 AWG wire.
 - 1) Pin Diameter: 0.079 inch.
 - 2) Quantity: 10.
 - 3) Manufacturer and Product:
 - a) Weidmuller, Type PS.
- 3. Spare Fuse Holder:
 - a. Provide spare fuse holder(s) for all enclosures containing fuses.
 - b. Quantity: As required to hold all spare fuses for each enclosure.
 - c. DIN Rail Mountable.
 - d. Manufacturer and Product: Weidmuller, 7914760001.
- 4. Terminal Block, General-Purpose:
 - a. Rated Voltage: 600V ac.
 - b. Rated Current: 30 amp.
 - c. Wire Size: 22 AWG to 10 AWG.
 - d. Rated Wire Size: 10 AWG.
 - e. Color: Grey body.
 - f. Spacing: 0.25 inch, maximum.
 - g. Test Sockets: One screw test socket 0.079-inch diameter.
 - h. Manufacturers and Products:
 - 1) Weidmuller WDU4 series; 1020100000 with 0280600000.
- 5. Terminal Block, Ground:
 - a. Wire Size: 22 AWG to 12 AWG.
 - b. Rated Wire Size: 12 AWG.
 - c. Color: Green and yellow body.
 - d. Spacing: 0.25 inch, maximum.

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- e. Grounding: Ground terminal blocks electrically grounded to the mounting rail.
- f. Manufacturers and Products:
 - 1) Weidmuller WDU4 series; 1010100000.
- 6. Terminal Block, Blade Disconnect Switch:
 - a. Rated Voltage: 600V ac.
 - b. Rated Current: 10-amp.
 - c. Wire Size: 22 AWG to 12 AWG.
 - d. Rated Wire Size: 12 AWG.
 - e. Color: Grey body, orange switch.
 - f. Spacing: 0.25 inch, maximum.
 - g. Manufacturers and Products:
 - 1) Weidmuller WDU4 series; 7910210000.
- 7. Terminal Block, Diode:
 - a. Rated Voltage: 24V dc.
 - b. Rated Current: 30 ma.
 - c. Wire Size: 16 AWG.
 - d. Manufacturers and Products:
 - 1) Weidmuller WDU4 series.
- 8. Terminal Block, Fused, 24V dc:
 - a. Rated Voltage: 600V dc.
 - b. Rated Current: 16-amp.
 - c. Wire Size: 22 AWG to 10 AWG.
 - d. Rated Wire Size: 10 AWG.
 - e. Color: Grey body.
 - f. Fuse: 0.25 inch by 1.25 inches.
 - g. Indication: LED diode 24V dc.
 - h. Spacing: 0.512 inch, maximum.
 - i. Manufacturers and Products:
 - 1) Weidmuller WDU4 series 1880410000.
- 9. Terminal Block, Fused, 120V ac:
 - a. Rated Voltage: 600V ac.
 - b. Rated Current: 16-amp.
 - c. Wire Size: 22 AWG to 10 AWG.
 - d. Rated Wire Size: 10 AWG.
 - e. Color: Grey body.
 - f. Fuse: 0.25 inch by 1.25 inches.
 - g. Indication: Neon Lamp 110V ac.
 - h. Leakage Current: 1.8 mA, maximum.
 - i. Spacing: 0.512 inch, maximum
 - j. Manufacturers and Products:
 - 1) Weidmuller WDU4 series 1880420000.

10. Terminal Block, Fused, 120V ac, High Current:
 - a. Rated Voltage: 600V ac.
 - b. Rated Current: 35 amps.
 - c. Wire Size: 18 AWG to 8 AWG.
 - d. Rated Wire Size: 8 AWG.
 - e. Color: Grey.
 - f. Fuse: 13/32 inch by 1.5 inches.
 - g. Spacing: 0.95 inch, maximum.
 - h. Manufacturers and Products: Weidmuller WDU4 series 7940029428.

- F. Grounding of Enclosures:
 1. Furnish isolated copper grounding bus for signal and shield ground connections.
 2. Ground bus grounded at a common signal ground point in accordance with National Electrical Code requirements.
 3. Single Point Ground for Each Analog Loop:
 - a. Locate at dc power supply for loop.
 - b. Use to ground wire shields for loop.
 4. Ground terminal block rails to ground bus.

- G. Analog Signal Isolators: Furnish signal isolation for analog signals that are sent from one enclosure to another. Do not wire in series instruments on different panels, cabinets, or enclosures.

2.02 ELECTRICAL TRANSIENT PROTECTION

- A. Surge Suppressors:
 1. General:
 - a. Construction: First-stage high-energy metal oxide varistor and second-stage bipolar silicon avalanche device separated by series impedance; includes grounding wire, stud, or terminal.
 - b. Response: 5 nanoseconds maximum.
 - c. Recovery: Automatic.
 - d. Temperature Range: Minus 20 degrees C to plus 85 degrees C.
 2. Suppressors on 120V ac Power Supply Connections:
 - a. Occurrences: Tested and rated for a minimum of 50 occurrences of IEEE C62.41 Category B test waveform.
 - b. First-Stage Clamping Voltage: 350 volts or less.

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- c. Second-Stage Clamping Voltage: 210 volts or less.
 - d. Continuous Operation: Power supplies for one four-wire transmitter or receiver: 5 amps minimum at 130V ac. All other applications: 30 amps minimum at 130V ac.
3. Suppressors on Analog Signal Lines:
- a. Test Waveform: Linear 8 microsecond rise in current from 0 amps to a peak current value followed by an exponential decay of current reaching one-half the peak value in 20 microseconds.
 - b. Surge Rating: Tested and rated for 50 occurrences of 2,000-amp peak test waveform.
 - 1) dc Clamping Voltage: 20 percent to 40 percent above operating voltage for circuit.
 - 2) dc Clamping Voltage Tolerance: Less than plus or minus 10 percent.
 - 3) Maximum Loop Resistance: 18 ohms per conductor.
4. Physical Characteristics:
- a. Mounted in Enclosures: Encapsulated in flame retardant epoxy.
 - b. For Analog Signal Lines: Citel DLAW-24D3.
 - c. For Modbus (RS-485) Signal Lines Citel DLAW-06D3.
 - d. For 120V ac Lines: Citel DS41S-120.
 - e. For 24V dc Lines: Citel DS210-24DC.
 - f. Field Mounted at Two-Wire Instruments: Encapsulated in stainless steel pipe nipples. EDCO SS64 series or equivalent Citel or Phoenix Contact.
 - g. Field Mounted at Modbus (RS-485) Instruments: With 120V ac surge suppressor, ac switch, and signal line surge suppressor, all in enclosure.
 - 1) Enclosure:
 - a) NEMA 4X Type 316 stainless steel with door.
 - b) Maximum Size: Coordinate size of each unit to fit within the transmitter hood.
 - 2) Custom build enclosure with devices using the appropriate Citel surge suppressors for power and Modbus listed above.
 - h. Field Mounted at Four-Wire Instruments: With 120V ac surge suppressor, ac switch, and signal line surge suppressor, all in enclosure.
 - 1) Enclosure:
 - a) NEMA 4X Type 316 stainless steel with door.
 - b) Maximum Size: Coordinate size of each unit to fit within the transmitter hood.
 - 2) Custom build enclosure with devices using the appropriate Citel surge suppressors for power and Analog signals listed above.

- B. Installation and Grounding of Suppressors: As shown. See Surge Suppressor Installation Details. Grounding equipment, installation of grounding equipment, and terminations for field mounted devices are provided under Division 26, Electrical, as specified in the Drawings.

2.03 WIRING

A. Wiring within PICS Panels:

1. Restrain by plastic ties or ducts or metal raceways.
2. Arrange wiring neatly, cut to proper length, and remove surplus wire.
3. Abrasion protection for wire bundles which pass through holes or across edges of sheet metal.
4. Connections to Screw Type Terminals:
 - a. Locking-fork-tongue or ring-tongue lugs.
 - b. Use manufacturer's recommended tool with required sized anvil to make crimp lug terminations.
 - c. Wires terminated in a crimp lug, maximum of one.
 - d. Lugs installed on a screw terminal, maximum of two.
5. Connections to Compression Clamp Type Terminals:
 - a. Strip, prepare, and install wires in accordance with terminal manufacturer's recommendations.
 - b. Wires installed in a compression screw and clamp, maximum of one for field wires entering enclosure, otherwise maximum of two.
6. Splicing and tapping of wires, allowed only at device terminals or terminal blocks.
7. Separate analog and dc circuits by at least 6 inches from ac power and control wiring, except at unavoidable crossover points and at device terminations.
8. Arrange wiring to allow access for testing, removal, and maintenance of circuits and components.

PART 3 EXECUTION

3.01 EXAMINATION

- A. For equipment not provided by PICS, but that directly interfaces with the PICS, verify the following conditions:
 1. Proper installation.
 2. Calibration and adjustment of positioners and I/P transducers.
 3. Correct control action.

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4. Switch settings and dead bands.
5. Opening and closing speeds and travel stops.
6. Input and output signals.

3.02 INSTALLATION

- A. Material and Equipment Installation: Retain a copy of manufacturers' instructions at site, available for review at all times.
- B. Wiring connected to PICS components and assemblies, including power wiring in accordance with requirements as specified in Division 26, Electrical as specified in the Drawings.
- C. Mechanical Systems:
 1. Drawings for PICS Mechanical Systems are diagrammatic and not intended to specifically define element locations or piping and tubing run lengths. Base materials and installations on field measurements.
 2. Copper and Stainless Steel Tubing Support: Continuously supported by an aluminum tubing raceway system.
 3. Plastic Tubing Supports: Except as shown on Drawings, provide continuous support in conduits or by aluminum tubing raceway system.
 4. Install tubing conduit for plastic tubing and tubing raceways parallel with, or at right angles to, structural members of buildings. Make vertical runs straight and plumb.
 5. Tubing and Conduit Bends:
 - a. Tool-formed without flattening, and all of same radius.
 - b. Bend Radius: Equal to or larger than conduit and tubing manufacturer's recommended minimum bend radius.
 - c. Slope instrument connection tubing in accordance with installation details.
 - d. Do not run liquid filled instrument tubing immediately over or within a 3-foot plan view clearance of electrical panels, motor starters, or mechanical mounting panel without additional protection. Where tubing must be located in these zones, shield electrical device to prevent water access to electrical equipment.
 - e. Straighten coiled tubing by unrolling on flat surface. Do not pull to straighten.
 - f. Cut tubing square with sharp tubing cutter. Deburr cuts and remove chips. Do not gouge or scratch surface of tubing.
 - g. Blow debris from inside of tubing.
 - h. Makeup and install fittings in accordance with manufacturer's recommendations. Verify makeup of tube fittings with manufacturer's inspection gauge.

- i. Use lubricating compound or TFE tape on stainless steel threads to prevent seizing or galling.
 - j. Run tubing to allow, e.g., clear access to doors, controls, and control panels; and to allow for easy removal of equipment.
 - k. Provide separate support for components in tubing runs.
 - l. Supply expansion loops and use adapters at pipe, valve, or component connections for proper orientation of fitting.
 - m. Keep tubing and conduit runs at least 12 inches from hot pipes.
 - n. Locate and install tubing raceways in accordance with manufacturer's recommendations. Locate tubing to prevent spillage, overflow, or dirt from above.
 - o. Securely attach tubing raceways to building structural members.
6. Enclosure Lifting Rings: Remove rings following installation and plug holes.

3.03 FIELD QUALITY CONTROL

A. Startup and Testing Team:

1. Thoroughly inspect installation, termination, and adjustment for components and systems.
2. Complete onsite tests.
3. Provide startup assistance.

B. Phase I: Operational Readiness Inspections and Calibrations: Prior to startup, inspect and test to ensure that entire PICS is ready for operation.

1. Loop/Component Inspections and Calibrations:
 - a. Check PICS for proper installation, calibration, and adjustment on a loop-by-loop and component-by-component basis.
 - b. Prepare component calibration sheet for each active component (except simple hand switches, lights, gauges, and similar items).
 - 1) Project name.
 - 2) Loop number.
 - 3) Component tag number.
 - 4) Component code number.
 - 5) Manufacturer for elements.
 - 6) Model number/serial number.
 - 7) Summary of Functional Requirements, for Example:
 - a) Indicators and recorders, scale and chart ranges.
 - b) Transmitters/converters, input and output ranges.
 - c) Computing elements' function.

- d) Controllers, action (direct/reverse) and control modes (PID).
- e) Switching elements, unit range, differential (fixed/adjustable), reset (auto/manual).
- 8) Calibrations, for Example:
 - a) Analog Devices: Actual inputs and outputs at 0, 10, 50, and 100 percent of span, rising and falling.
 - b) Discrete Devices: Actual trip points and reset points.
 - c) Controllers: Mode settings (PID).
- 9) Space for comments.
- c. Check signal integrity from field sensor all the way up to field I/O points.
- d. These inspections and calibrations will be spot checked.

C. Performance Acceptance Tests (PAT):

- 1. General:
 - a. Test all PICS elements to demonstrate that PICS satisfies all requirements.
 - b. Test Format: Cause and effect.
 - 1) Person conducting test initiates an input (cause).
 - 2) Specific test requirement is satisfied if correct result (effect) occurs.
 - c. Procedures, Forms, and Checklists:
 - 1) Conduct tests in accordance with, and documented on, Owner accepted procedures, forms, and checklists.
 - 2) Describe each test item to be performed.
 - 3) Have space after each test item description for sign off by appropriate party after satisfactory completion.
 - d. Required Test Documentation: Test procedures, forms, and checklists. All signed by Owner.
 - e. Conducting Tests:
 - 1) Provide special testing materials, equipment, and software.
 - 2) Wherever possible, perform tests using actual process variables, equipment, and data.
 - 3) If it is not practical to test with real process variables, equipment, and data, provide suitable means of simulation.
 - 4) Define simulation techniques in test procedures.
 - f. Coordinate PICS testing with Owner.
- 2. Test Requirements:
 - a. Once facility has been started up and is operating, perform a witnessed PAT on complete PICS to demonstrate that it is operating as required. Demonstrate each required function on a paragraph-by-paragraph and loop-by-loop basis.
 - b. Perform local and manual tests for each loop before proceeding to remote and automatic modes.

- c. Where possible, verify test results using visual confirmation of process equipment and actual process variable. Unless otherwise directed, exercise and observe devices supplied by others, as needed to verify correct signals to and from such devices and to confirm overall system functionality. Test verification by means of disconnecting wires or measuring signal levels is acceptable only where direct operation of plant equipment is not possible.
- d. Make updated versions of documentation required for PAT available to Owner at site, both before and during tests.
- e. Make one copy of O&M Manuals available to Owner at the site both before and during testing.
- f. Refer to referenced examples of PAT procedures and forms in Article SUPPLEMENTS.

3.04 SUPPLEMENTS

- A. Supplements listed below, following “END OF SECTION,” are part of this Specification.
 - 1. Instrument Calibration Sheet: Provides detailed information on each instrument (except simple hand switches, lights, and similar items).
 - 2. Performance Acceptance Test Sheet: Describes the PAT for a given loop. The format is mostly free form.
 - a. Lists the requirements of the loop.
 - b. Briefly describes the test.
 - c. Cites expedited results.
 - d. Provides space for check off by witness.

END OF SECTION

JACOBS

INSTRUMENT CALIBRATION SHEET

Rev.06.05.92

COMPONENT			MANUFACTURER				PROJECT				
Code:			Name:				Number:				
Name:			Model:				Name:				
			Serial #:								
FUNCTIONS											
Indicate? Y / N	RANGE	VALUE	UNITS	COMPUTING FUNCTIONS? Y / N			CONTROL? Y / N				
	Chart:			Describe:			Action? direct / reverse Modes? P / I / D				
Record? Y / N	Scale:						SWITCH? Y / N				
Transmit/ Convert? Y / N	Input:						Unit Range:				
	Output:						Differential: fixed/adjustable				
						Reset? automatic / manual					
ANALOG CALIBRATIONS					DISCRETE CALIBRATIONS					Note No.	
REQUIRED			AS CALIBRATED				REQUIRED				AS CALIBRATED
Input	Indicated	Output	Increasing Input		Decreasing Input		Number	Trip Point	Reset Pt.	Trip Point	Reset Pt.
			Indicated	Output	Indicated	Output					
CONTROL MODE SETTINGS:			P:	I:	D:		7.				
#	NOTES:									Component Calibrated and Ready for Startup By: Date: Tag No.:	

JACOBS

INSTRUMENT CALIBRATION SHEET
EXAMPLE - ANALYZER/TRANSMITTER

Rev.06.05.92

COMPONENT			MANUFACTURER				PROJECT					
Code: <i>A7</i>			Name: <i>Leeds & Northrup</i>				Number: <i>WDC30715.B2</i>					
Name: <i>pH Element & Analyzer/Transmitter</i>			Model: <i>I2429-3-2-1-7</i>				Name: <i>UOSA AWT PHASE 3</i>					
			Serial #: <i>11553322</i>									
FUNCTIONS												
Indicate? Y Record? N	RANGE	VALUE	UNITS	COMPUTING FUNCTIONS? N			CONTROL? N					
	Chart:			Describe:			Action? direct / reverse Modes? P / I / D					
	Scale:	<i>1-14</i>	<i>pH units</i>				SWITCH? N					
Transmit/ Convert? Y	Input:	<i>1-14</i>	<i>pH units</i>				Unit Range:					
	Output:	<i>4-20</i>	<i>mA dc</i>				Differential: fixed/adjustable Reset? automatic / manual					
ANALOG CALIBRATIONS							DISCRETE CALIBRATIONS					Note No
REQUIRED			AS CALIBRATED				REQUIRED			AS CALIBRATED		
Input	Indicated	Output	Increasing Input		Decreasing Input		Number	Trip Point	Reset Pt.	Trip Point	Reset Pt.	
			Indicated	Output	Indicated	Output						(note rising or falling)
<i>1.0</i>	<i>1.0</i>	<i>4.0</i>	<i>1.0</i>	<i>4.0</i>	<i>1.0</i>	<i>3.9</i>	1.	<i>N.A.</i>		<i>N.A.</i>		
<i>2.3</i>	<i>2.3</i>	<i>5.6</i>	<i>2.2</i>	<i>5.5</i>	<i>2.3</i>	<i>5.6</i>	2.					<i>I.</i>
<i>7.5</i>	<i>7.5</i>	<i>12.0</i>	<i>7.5</i>	<i>11.9</i>	<i>7.5</i>	<i>12.0</i>	3.					
<i>12.7</i>	<i>12.7</i>	<i>18.4</i>	<i>12.7</i>	<i>18.3</i>	<i>12.6</i>	<i>18.3</i>	4.					
<i>14.0</i>	<i>14.0</i>	<i>20.0</i>	<i>14.0</i>	<i>20.0</i>	<i>14.0</i>	<i>20.0</i>	5.					
							6.					
							7.					
CONTROL MODE SETTINGS:			P: <i>N.A.</i>	I:	D:							
#	NOTES:										Component Calibrated and Ready for Startup By: <i>J.D. Sewell</i> Date: <i>Jun-6-92</i> Tag No.: <i>AIT-12-6[pH]</i>	
	<i>1. Need to recheck low pH calibration solutions.</i>											

SECTION 40 90 11
COMPONENTS AND PANELS SUBSYSTEM (CPS)

PART 1 GENERAL

1.01 DEFINITIONS

- A. Abbreviations:
1. FDT: Factory Demonstration Test.
 2. PLC: Programmable Logic Controller.
 3. VFD: Variable Frequency Drive.
- B. Rising/Falling: Terms used to define actions of discrete devices about their set points.
1. Rising: Contacts close when an increasing process variable rises through set point.
 2. Falling: Contacts close when a decreasing process variable falls through set point.
- C. Signal Types:
1. Analog Signals, Current Type:
 - a. 4 to 20 mA dc signals conforming to ISA S50.1.
 - b. Unless otherwise indicated for specific CPS Subsystem components, use the following ISA 50.1 options:
 - 1) Transmitter Type: Four wire.
 - 2) Fully isolated transmitters and receivers.
 2. Analog Signals, Voltage Type: 1 to 5 volts dc within panels where a common high precision dropping resistor is used.
 3. Discrete signals, two-state logic signals using dc or 120V ac sources as indicated.
 4. Pulse Frequency Signals:
 - a. Direct current pulses whose repetition rate is linearly proportional to process variable.
 - b. Pulses generated by contact closure or solid state switches as indicated.
 - c. Power source less than 30V dc.
 5. Special Signals: Other types of signals used to transmit analog and digital information between field elements, transmitters, receivers, controllers, and digital devices.
- D. CPS Components: Equipment listed under Component Specifications reference in Article Supplements.

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1.02 SYSTEM DESCRIPTION

- A. This section covers requirements for Components and Panels Subsystem (CPS).
- B. Work includes engineering, fabrication, testing, and documenting for complete control panels as specified herein and on the Drawings.
- C. After the first panel is fabricated and tested to SJCUD's satisfaction, the panel shall be available for field testing to be performed by SJCUD. Production of the remaining panels shall begin when written approval of modifications is received from SJCUD.
- D. Detailed Design: CPS as shown and specified includes functional and performance requirements and Component Specifications. Complete detailed CPS design. The Drawings are a part of the functional requirements of this CPS specification. They are modified versions of the drawings created by the past standard supplier of SJCUD's well SCADA panels. These Drawings do not necessary comply with the drawing format/content specification included herein.
 - 1. Component numbering (e.g. terminal block numbers, relay numbers) from the previous drawings have been retained, but the new panels do not need to match these designations.
 - 2. Panel Interior and Exterior Door Layouts: Panel layout shall generally follow the layout shown on the Drawings.
 - 3. Processor Connections and Panel Bill-of-Materials: A surge arrestor between the Modbus cable entry and the OLM module has been added. The CPU, digital input and output modules and SINAUT have been revised for RIO. This shall be included with the panel. The bill-of-materials specifies the components to be used. Substitutions will be considered on a case-by-case basis. The bill of materials is supplemented by functional specifications for some components.

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. Bill-of-Materials: List of required CPS equipment.
 - a. Group equipment items as follows:
 - 1) CPS Components: By component identification code.
 - 2) Other CPS Equipment: By equipment type.
 - b. Data Included:
 - 1) Equipment tag number.
 - 2) Description.

- 3) Manufacturer, complete model number and all options not defined by model number.
- 4) Quantity supplied.
- 5) Component identification code where applicable.
2. Catalog Cuts: CPS components, electrical devices, and mechanical devices:
 - a. Catalog information.
 - b. Descriptive literature.
 - c. External power and signal connections.
 - d. Scaled drawings showing exterior dimensions and locations of all electrical and mechanical interfaces.
3. Component Data Sheets: Data sheets for all CPS components.
 - a. Format and Level of Detail: In accordance with ISA-S20.
 - b. Include component type identification code on data sheet.
 - c. Specific features and configuration data for each component:
 - 1) Location or service.
 - 2) Manufacturer and complete model number.
 - 3) Size and scale range.
 - 4) Set points.
 - 5) Materials of construction.
 - 6) Options included.
 - d. Name, address, and telephone number of manufacturer's local office, representative, distributor, or service facility.
4. Sizing and Selection Calculations:
 - a. Primary Elements: Complete calculations plus process data used. For example, for flow elements: Minimum and maximum values, permanent head loss, and assumptions made.
 - b. Controller, computing, and Function Generating Modules: Actual scaling factors with units and how they were computed.
5. Panel Construction Drawings:
 - a. Scale Drawings: Show dimensions and locations of panel mounted devices, doors, louvers, subpanels, internal and external.
 - b. Panel Legend: List front of panel devices by tag numbers, nameplate inscriptions, service legends, and annunciator inscriptions.
 - c. Bill of Materials: List devices mounted within panel that are not listed in panel legend. Include tag number, description, manufacturer, and model number.
 - d. Construction Details: NEMA rating, materials, material thickness, structural stiffeners and brackets, lifting lugs, mounting brackets and tabs, door hinges and latches, and welding and other connection callouts and details.
 - e. Construction Notes: Finishes, wire color schemes, wire ratings, wire, terminal block numbering, and labeling scheme.

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6. Panel Control Diagrams: For discrete control and power circuits.
 - a. Diagram Type: Ladder diagrams. Include devices, related to discrete functions, that are mounted in or on the panel and that require electrical connections. Show unique rung numbers on left side of each rung.
 - b. Item Identification: Identify each item with attributes listed.
 - 1) Wires: Wire number and color. Cable number if part of multi-conductor cable.
 - 2) Terminals: Location (enclosure number, terminal junction box number, or MCC number), terminal strip number, and terminal block number.
 - 3) Discrete Components:
 - a) Tag number, terminal numbers, and location (“FIELD,” enclosure number, or MCC number).
 - b) Switching action (open or close on rising or falling process variable), set point value and units, and process variable description (e.g. Sump Level High).
 - 4) I/O Points: PLC or microprocessor base number, I/O tag number, I/O address, terminal numbers, and terminal strip numbers.
 - 5) Relay Coils:
 - a) Tag number and its function.
 - b) On right side of rung where coil is located, list contact location by ladder number and sheet number.
Underline normally closed contacts.
 - 6) Relay Contacts: Coil tag number, function, and coil location (ladder rung number and sheet number).
 - c. Show each circuit individually. No “typical” diagrams or “typical” wire lists will be allowed.
 - d. Ground wires, surge protectors, and connections.
7. Panel Wiring Diagrams: Show point-to-point and terminal-to-terminal wiring within panels.
8. Panel Power Requirements and Heat Dissipation: For control panels tabulate and summarize:
 - a. Required voltages, currents, and phases(s).
 - b. Maximum heat dissipations Btu per hour.
 - c. All calculations.
9. Interconnecting Wiring Diagrams:
 - a. Diagrams, device designations, and symbols in accordance with NEMA ICS 250.
 - b. Show each circuit individually. No “typical” wiring diagrams will be allowed.

B. Quality Control Submittals:

1. Testing Related Submittals:
 - a. Unwitnessed Factory Test: No Submittals required.
 - b. Factory Demonstration Test:
 - 1) Preliminary Test Procedures: Outlines of proposed tests, forms, and checklist.
 - 2) Final Test Procedures: Proposed test procedures, form, and checklist. Approved test procedure submittal is a prerequisite to conducting factory test.
 - 3) Test Documentation: Copy of signed off test procedures when tests are completed.
2. O&M Manuals:
 - a. Refer to paragraph Shop Drawings for the following items:
 - 1) Bill-of-Materials.
 - 2) Catalog cuts.
 - 3) Component data sheets.
 - 4) Panel wiring diagrams, one reproducible copy.
 - 5) Loop diagrams, one reproducible copy.
 - 6) Interconnecting wiring diagrams, one reproducible copy.
 - b. Device O&M manuals for CPS components, electrical devices, and mechanical devices shall include:
 - 1) Operations procedures.
 - 2) Installation requirements and procedures.
 - 3) Maintenance requirements and procedures.
 - 4) Troubleshooting procedures.
 - 5) Calibration procedures.
 - 6) Internal schematic and wiring diagrams.
 - c. List of spares and expendables required and recommended.

PART 2 PRODUCTS

2.01 CPS COMPONENTS

- A. Components: Furnish all equipment that is necessary to achieve required performance.

2.02 NAMEPLATES AND TAGS

- A. Component Nameplates-Panel Face: Component identification located on panel face under or near component.
1. Location and Inscription: As shown on panel Drawing.
 2. Materials: Adhesive backed, laminated plastic.

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3. Letters: 3/16-inch black on white background, unless otherwise noted.
 4. In addition to adhesive backing, fasten nameplate to panel using Type 316 stainless steel self-tapping screws.
- B. Component Nameplates-Back of Panel: Component identification located on or near component inside of enclosure.
1. Inscription: Component tag number.
 2. Materials: Adhesive backed, laminated plastic.
 3. Letters: 3/16-inch black on white background, unless otherwise noted.
- C. Service Legends: Component identification nameplate located on face of component.
1. Inscription: As shown on panel drawing.
 2. Materials: Adhesive backed, laminated plastic.
 3. Letters: 3/16-inch black on white background, unless otherwise noted.

2.03 PANEL FABRICATION

- A. General:
1. Panels with external dimensions and instruments arrangement as specified on Drawings, except as modified in SCUD-approved Shop Drawings.
 2. Panel Construction and Interior Wiring: In accordance with the National Electrical Code (NEC), state and local codes, and applicable sections of NEMA, ANSI, UL, and ICECA.
 3. Fabricate panels, install instruments, wire, and plumb, all at the Manufacturer's factory.
 4. All panels shall bear UL label stating listing per UL 508A.
 5. Electrical Work: In accordance with the applicable requirements of NEC.
- B. Corrosion Inhibiting Vapor Capsules: Prior to shipment, insert corrosion inhibiting vapor capsules in each panel.
- C. Temperature Control:
1. Design Basis:
 - a. Ambient temperature range (deg. F): 15 to 100.
 - b. Outdoor installation with panel face to north.
 - c. Installing contractor will provide solar shield on south side (back).

2. Solar Shields:
 - a. Location: Top and sides. Top shield to extend 6 inches beyond front of enclosure.
 - b. Air gap: 1 inch.
 - c. Material: Same as collar stud. Aluminum can be provided for non-aluminum collar stud if rubber gaskets or washers isolate stud and shield.
 - d. Attachment to Enclosure: Welded collar stud, same material as enclosure
3. Temperature Calculations: Perform temperature calculations to ensure the internal panel temperature does not exceed the maximum temperature rating of any panel component. If a component's maximum temperature rating will be exceeded, the Standard supplier may provide a component with a higher rating or increase the panel size with the approval of SJCUD.
4. Space Heaters:
 - a. Thermostatically controlled to maintain internal panel temperatures above dew point.
 - b. Required for all panels.

D. Panel Construction:

1. Based on environmental design requirements and referenced in Article Environmental Requirements, provide the following:
 - a. For panels:
 - 1) Enclosure Type: NEMA 4X.
 - 2) Materials: Aluminum, unless otherwise noted.
 2. Doors:
 - a. Rubber-gasketed with continuous hinge.
 - b. Stainless steel single handle, locking.
 - c. Suitable for lock with 3/8-inch shank.
 3. Data Pocket:
 - a. Provide per bill of materials.
 - b. Provide laminated set of panel drawings, updated after functional testing in the field, for insertion into data pocket.
 4. Mounting Kit: Provided.
 - a. Material: Same as enclosure.
 - b. Ingress Protection: Tested by Manufacturer to maintain ingress protection rating of enclosure.
 - c. Function: Provides mounting tabs with predrilled hole for mounting to external frame.
 5. Manufacturers: Hoffman Engineering Co.

E. Control Panel Electrical:

1. Power Distribution within Panels:
 - a. Feeder Circuits:
 - 1) One or more 120V ac, 60-Hz feeder circuits as shown on Drawings.
 - 2) Make provisions for feeder circuit conduit entry.
 - 3) Furnish terminal board for termination of wires.
 - b. Power Panel: Furnish main circuit breaker and a circuit breaker on each individual branch circuit distributed from power panel.
 - 1) Locate to provide clear view of and access to breakers when door is open.
 - 2) Breaker Sizes: Coordinate such that fault in branch circuit will blow only branch breaker but not trip the main breaker.
 - a) Branch Circuit Breakers: 15 amps at 250V ac.
 - c. Circuit Wiring: Drawings show function only. Use following rules for actual circuit wiring:
 - 1) Devices on Single Circuit: 20, maximum.
 - 2) Multiple Units Performing Parallel Operations: To prevent failure of any single branch circuit from shutting down entire operation, do not group all units on same branch circuit.
 - 3) Branch Circuit Loading: 12 amperes continuous, maximum.
 - 4) Panel Lighting and Service Outlets: Put on separate 15-amp 120V ac branch circuit.
 - 5) Provide 120-volt ac plugmold for panel components with line cords.
 - 6) Provide 120-volt ac outlet.
2. Signal Distribution:
 - a. Within Panels: 4 to 20 mA dc signals may be distributed as 1 to 5V dc.
 - b. Outside Panels: Isolated 4 to 20 mA dc only.
 - c. All signal wiring shall be twisted, shielded pairs.
3. Signal Switching:
 - a. Use dry circuit type relays or switches.
 - b. No interruption of 4 to 20 mA loops during switching.
 - c. Switching Transients in Associated Signal Circuit:
 - 1) 4 to 20 mA dc Signals: 0.2 mA, maximum.
 - 2) 1 to 5V dc Signals: 0.05V, maximum.
4. Relays:
 - a. General:
 - 1) Relay Mounting: Plug-in type socket.
 - 2) Relay Enclosure: Furnish dust cover.
 - 3) Socket Type: Screw terminal interface with wiring.

- 4) Socket Mounting: Rail.
 - 5) Provide hold down clips.
 - b. Signal Switching Relay:
 - 1) Type: Dry circuit.
 - 2) Contact Arrangement: 2 Form C contacts.
 - 3) Contact Rating: 0 to 5 amps at 28V dc or 120V ac.
 - 4) Contact Material: Gold or silver.
 - 5) Coil Voltage: As noted or shown.
 - 6) Coil Power: 0.9 watts (dc), 1.2VA (ac).
 - 7) Expected Mechanical Life: 10,000,000 operations.
 - 8) Expected Electrical Life at Rated Load: 100,000 operations.
 - 9) Indication Type: Neon or LED indicator lamp.
 - 10) Seal Type: Hermetically sealed case.
 - c. Control Circuit Switching Relay, Non-latching:
 - 1) Type: Compact general purpose plug-in.
 - 2) Contact Arrangement: 3 Form C contacts.
 - 3) Contact Rating: 10A at 28V dc or 240V ac.
 - 4) Contact Material: Silver cadmium oxide alloy.
 - 5) Coil Voltage: As noted or shown.
 - 6) Coil Power: 1.8 watts (dc), 2.7VA (ac).
 - 7) Expected Mechanical Life: 10,000,000 operations.
 - 8) Expected Electrical Life at Rated Load: 100,000 operations.
 - 9) Indication Type: Neon or LED indicator lamp.
 - 10) Push-to-test button.
5. Power Supplies:
- a. Furnish as required to power instruments requiring external dc power, including two-wire transmitters and dc relays.
 - b. Convert 120V ac, 60-Hz power to dc power of appropriate voltage(s) with sufficient voltage regulation and ripple control to assure that instruments being supplied can operate within their required tolerances.
 - c. Provide output over voltage and over current protective devices to:
 - 1) Protect instruments from damage due to power supply failure.
 - 2) Protect power supply from damage due to external failure.
 - d. Enclosures: NEMA 1.
 - e. Fuses: For each dc supply line to each individual two-wire transmitter.
 - 1) Type: Indicating.
 - 2) Mount so fuses can be easily seen and replaced.

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6. Hand Switches and Indicating Lights:
 - a. General:
 - 1) Function: Select, initiate, and display discrete control functions.
 - 2) Type: Heavy-duty, corrosion-resistant, industrial.
 - b. General Features:
 - 1) Mounting: 30.5 mm, single round hole. Panel thickness 1/16 inch to 1/4 inch.
 - 2) Legend Plate: Standard size square style laminate with white field and black markings, unless otherwise noted. Markings as shown.
 - 3) Configuration: Light, pushbutton, or switch as noted or shown.
 - c. Light Features:
 - 1) Lights: 6V ac lamps and integral transformer for operation for operation from 120V ac, unless otherwise noted.
 - 2) Lens Color: Color as specified under PANEL, STANDARD LIGHT COLOR AND INSCRIPTIONS, or as noted.
 - d. Switch Features:
 - 1) Guard: Full guard with flush button, unless otherwise noted.
 - 2) Three-position Cylinderlock: Allen-Bradley 800T J44 (H-O-A) with one NO and one NC contact block (800-T-XA). When noted see Instrument List. All locks shall work from a single SJCUD-supplied key.
 - e. Pushbutton and Switch Features:
 - 1) Guard: Full guard with flush button, unless otherwise noted.
 - 2) Operator: Black pushbutton, black nonilluminated knob on switch, unless otherwise noted.
 - 3) Boot: None, unless otherwise noted.
 - f. Signal Interface:
 - 1) Contact Block:
 - a) Type: Silver-coated butting, unless otherwise noted.
 - b) Rating: 10 amps continuous at 120V ac or as noted.
 - c) Sequence: Break-before-make, unless otherwise shown.
 - d) Arrangement: Normally open or normally closed as shown, or to perform the functions noted.
 - e) Terminals: Screw with strap clamp, unless otherwise noted.
 - g. NEMA Rating: NEMA 4X, corrosion-resistant.

7. Programmable Logic Controller System:
 - a. General:
 - 1) Function: Used for process monitoring and control by emulating functions of conventional panel mounted equipment such as relays, timers, counters, current switches, calculation modules, PID controllers, stepping switches, and drum programmers.
 - 2) Type: Microprocessor based device programmable using ladder logic.
 - b. Components: As shown on Drawings.
 - c. Manufacturer:
 - 1) Siemens, 300 series.
 - 2) No exceptions.
8. Conductor Colors:
 - a. 120V ac Control wiring: Red on hot side, white on neutral.
 - b. 24V dc: Blue.
 - c. Ground: Green.
 - d. System Identification: Place a laminated guide to conductor colors within the enclosure.
9. Internal Wire Identification:
 - a. Numbered and tagged at each termination.
 - b. Wire Tags: Machine printed, plastic sleeves.
10. Internal Panel Lights and Service Outlets for Smaller Panels:
 - a. Internal Panel Light: Switched 100-watt incandescent light.
 - b. Service Outlet: Breaker protected 120-volt, 15-amp, duplex receptacle:

F. Factory Finishing:

1. Stainless Steel and Aluminum: As shown on the Drawings.

2.04 ELECTRICAL TRANSIENT PROTECTION

A. General:

1. Function: Protect elements of CPS against damage due to electrical transients induced in interconnecting lines by lightning and nearby electrical systems.
2. Implementation: Provide, install, coordinate, and inspect grounding of surge suppressors at:
 - a. Connection of ac power, analog signals and networks (e.g. Modbus) to CPS equipment panels.
 - b. Surge suppressor for connection of antenna to radio will be supplied and field installed by others into CPS enclosure.

3. Construction: First-stage gas tube and secondary-stage bipolar silicon avalanche device separated by series impedance. Includes grounding wire, stud, and terminal.
4. Response: 5 nanoseconds maximum.
5. Recovery: Automatic.
6. Temperature Range: Minus 20 degrees C to plus 85 degrees C.

2.05 UNINTERRUPTIBLE POWER SUPPLY (UPS)

A. Components: UPS and enclosure.

1. Enclosure: Provide with adequate clear space for UPS wiring.
 - a. Type: NEMA 3R.
 - b. Dimensions: Maximum width 30 inches, Maximum height 48 inches
 - c. Materials: Type 304 stainless steel, unless otherwise noted.
 - d. Metal Thickness: 14-gauge, minimum.
 - e. Doors:
 - 1) Rubber-gasketed with continuous hinge.
 - 2) Stainless steel single handle, locking.
 - 3) Suitable for lock with 3/8-inch shank.
 - f. Mounting Kit: Provided.
 - 1) Material: Same as enclosure
 - 2) Ingress Protection: Tested by Manufacturer to maintain ingress protection rating of enclosure.
 - 3) Function: Provides mounting tabs with predrilled hole for mounting to external frame.
2. UPS:
 - a. General:
 - 1) Function: Provides isolated, regulated uninterrupted ac output power during a complete or partial interruption of incoming line power.
 - 2) Major Parts: Inverter, battery charger, sealed battery.
 - b. Performance:
 - 1) Capacity: 50 percent spare capacity above computed maximum panel load.
 - 2) Input Power:
 - a) 120 V ac single phase, 60-Hz, unless otherwise noted.
 - b) Connections: Manufacturer's standard, unless otherwise noted.
 - 3) Output Power:
 - a) 120 V ac single phase, 60-Hz, unless otherwise noted.
 - b) Connections: Manufacturer's standard, unless otherwise noted.

- 4) On-line Efficiency: 85 percent minimum, unless otherwise noted.
 - 5) Backup Runtime:
 - a) Full Load: 9 minutes minimum, unless otherwise noted.
 - b) Half Load: 20 minutes minimum, unless otherwise noted.
 - 6) Continuous no-break power with no measurable transfer time.
 - 7) Sine-Wave Output Voltage Total Harmonic Distortion (THD): Plus or minus 6 percent or less.
 - 8) Input Voltage Range: Plus 15 percent, minus 20 percent.
 - 9) Output Voltage Regulation: Plus or minus 3 percent nominal.
 - 10) Operating Temperature: 0 degrees to 40 degrees C (32 degrees to 104 degrees F).
 - 11) Operating Relative Humidity: 5 percent to 95 percent without condensation.
 - 12) Lightning and Surge Protection:
 - a) Pass lightning standard IEEE C62.41 Categories A and B tests.
 - b) 2000 to 1 attenuation of input spike.
- c. Features:
- 1) Enclosure: Tower, unless otherwise noted.
- d. Manufacturers and Products: Refer to SJCUD provided Bill of Material in Supplement 2, Sheet 1 of 4 of this section.

2.06 SOURCE QUALITY CONTROL

- A. Factory Demonstration Tests: Demonstrate to SJCUD that CPS panels and assemblies included in these tests conform to related Submittals and requirements specified.

PART 3 EXECUTION

3.01 FACTORY DEMONSTRATION TEST (FDT)

- A. Unwitnessed Factory Test (UFT):
1. Scope: Inspect and test each control panel to ensure it is operational, ready for FDT.
 2. Location: CPS Manufacturer's Factory.

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3. Integrated Test:
 - a. Interconnect and test CPS.
 - b. Exercise and test all functions.
 - c. Provide stand-alone testing of smaller CPS panels.
 - d. Simulate inputs and outputs for primary elements, final control elements, and CPS panels excluded from test.
- B. Factory Demonstration Tests (FDT):
1. Scope: Test the CPS panel to demonstrate that it is operational and meets SJCUD's requirements. Test shall be witnessed by SJCUD.
 2. Location: CPS Manufacturer provided facility within 100 miles of SJCUD headquarters in Saint Augustine, Florida.
 3. Tests shall include:
 - a. Inspection of panel and components.
 - b. Verification of all circuits: Provide a test panel with switches, 4 to 20 ma sources and indicating lights. Prewire test panel to CPS enclosure and label test panel devices. Provide a test program for the PLC. Standard supplier shall provide a test procedure for this portion of factory testing.
 - 1) No testing of radio communications required.
 - c. SJCUD verification of software function: No test procedure required for this testing. Provide SJCUD 1 day in factory for testing of SJCUD's application software. Prewire test panel to CPS enclosure and label test panel devices. If the SJCUD desires to do associated testing, SJCUD will provide Modbus slaves for testing of Modbus networking.
 4. Correct deficiencies found in CPS enclosure and complete prior to shipment to Site.
 5. Failed Tests:
 - a. Repeat and witnessed by SJCUD.
 - b. With approval of SJCUD, certain tests may be conducted by CPS Manufacturer and witnessed by SJCUD as part of FDT.
 6. Make following documentation available to the SJCUD at test site both before and during FDT:
 - a. All Drawings, Specifications, Addenda, and Change Orders.
 - b. Master copy FDT procedures.
 - c. List of equipment to be tested including make, model, and serial number.
 - d. Shop Drawings hardware Submittals for equipment being tested.

C. Functional Testing:

1. Scope: Test the CPS panel to demonstrate that it is operational and meets SJCUD's requirements. Test shall be witnessed by SJCUD.
2. Location: SJCUD well site within SJCUD service area.
3. Tests shall include:
 - a. Verification of all circuits:
 - 1) Test pump and limit switch interface circuits by actual operation of well pump.
 - 2) Test power status by removing power.
 - 3) Test motor over temperature by testing temperature input to starter; not by jumpering starter output signal.
 - 4) Verify that analog inputs are received and scaled correctly.

END OF SECTION

**DRAWINGS
(BOUND SEPARATELY)**

ST. JOHNS COUNTY UTILITY DEPARTMENT

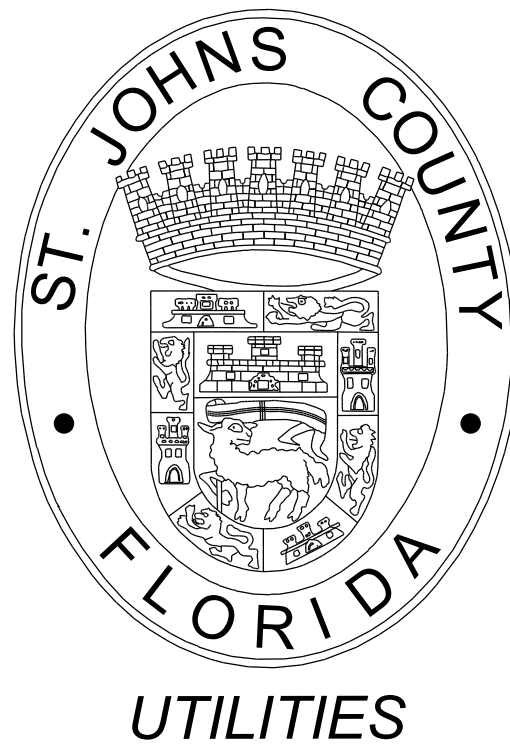
NORTHWEST WELL NO. 7

WELLHEAD AND SITE CONSTRUCTION PROJECT

BID DOCUMENTS



PROJECT LOCATION MAP



BOARD OF COUNTY COMMISSIONERS

CHRISTIAN WHITEHURST, COMMISSIONER
 JEB SMITH, COMMISSIONER
 PAUL WALDRON, COMMISSIONER
 JEREMIAH RAY BLOCKER, COMMISSIONER
 HENRY DEAN, COMMISSIONER

COUNTY ADMINISTRATOR

HUNTER S. CONRAD

DIRECTOR OF UTILITIES

WILLIAM G. YOUNG

ASSISTANT DIRECTOR OF UTILITIES

GORDON SMITH, P.E.

CHIEF ENGINEER - CAPITAL IMPROVEMENT

SCOTT TRIGG, P.E.

WATER OPERATIONS SUPERINTENDENT

BARRY STEWART

Jacobs

GENERAL
COVER SHEET

200 W FORSYTH STREET, SUITE 1520
 JACKSONVILLE, FLORIDA 32202
 EA0001992
 Lawrence Bradley Gunn, P.E. FL 65967

NORTHWEST WELL NO. 7
 WELLHEAD AND SITE
 ST. JOHNS COUNTY UTILITY DEPARTMENT
 ST. AUGUSTINE, FLORIDA

VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MAY 2021
PROJ	EGXM1300
DWG	G-01
SHEET	1 of 26

BID DOCUMENTS

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A	AB	ABDN	AC	AC	ACI	ACST	ACU	AD	ADD	AFD	AFF	AG	AGGR	AHR	AISC	AL (ALUM)	ALKY	ALTN. (ALT)	AM	ANDZ	APPROX	APVD	ARCH	AR	ARV	ASU	ATS	AUTO	AUX	AVG	AVRV	@	B	(B)	BAL	BD	BF	BFV	BL	BFP	BLDG	BLK	BM	BM	BOT, BOTT, B/	BRG	BSP	BV	BVC	C	°C	C-C	CAB	CAR	CB	CB	CC	CCP	CCS	CFM	CHAN, C	CHDPE	CHEM	CI	CIP	CIPS	CJ	CKT	CL	CL	CLDI	CLG	CLO	CLR	CL2	CMP	CMP	CMU	CO	COL	CONC	CONDTN	CONN	CONST	CONT	CONTR	COORD	CP	CP-X	CPLG	CPRSR	CPT	CPVC	CR	CRS	CRS	PVC COATED RIGID STEEL	CUP SINK	CERAMIC SUSPENDED ACOUSTICAL	TILE CEILING	CERAMIC TILE	CURRENT TRANSFORMER	CENTER	CENTERED	COUNTERSUNK	CUBIC	CUBIC FOOT	CUBIC INCH	CUBIC YARD	COPPER TUBING, HARD DRAWN	CHECK VALVE	CABINET DOOR MOUNTED	WASTE RECEPTACLE	DRAIN	PENNY NAIL SIZE	DATA ACQUISITION SYSTEM	DEFORMED BAR ANCHOR	DOUBLE	DIRECT CURRENT	DEGREE	DETAIL	DOUGLAS FIR	DRINKING FOUNTAIN	DEPT OF HEALTH AND ENVIRONMENTAL CONTROL	DROP INLET	DUCTILE IRON	DIAMETER	DIAGONAL	DUCTILE IRON PIPE	DIRECTION	DISCHARGE	DIRECT-ON-LINE	DOWNSPOUT	DRAWING	DOWN	DELTA	EAST	EMPTY	EACH	ECCENTRIC	EMERGENCY EYEWASH	EACH FACE	EXHAUST FAN	ELEVATION	ELBOW	EXTERIOR INSULATION FINISH SYSTEM	ELECTRICAL LOAD CENTER	ELECTRIC, ELECTRICAL	ENGINEER	EDGE OF GUTTER	EDGE OF PAVEMENT	EDGE OF PAVING	EXPLOSION PROOF	EQUAL	EQUALLY SPACED	EQUIPMENT	ELAPSED TIME METER	END OF VERTICAL CURVE	EACH WAY	EXHAUST	EXPANSION	EXPOSED	EXPANSION ANCHOR BOLT	EXPANSION JOINT	EXISTING	EXTERIOR	DEGREE FAHRENHEIT	FUSE	FRESH AIR INLET	FLEXIBLE CONDUIT	FLANGED COUPLING ADAPTER	FREE CHLORINE RESIDUAL	FLOOR CLEANOUT	FACTORY	FLOOR DRAIN	FOUNDATION	FEEDER	FIRE EXTINGUISHER	FINISHED FLOOR	FINISH GRADE	FIRE HYDRANT	FIGURE	FLOW LINE	FLANGE	FLOOR	FLEXIBLE	FLAT HEAD	FILTER	FLUORESCENT	FORCE MAIN	FINISH	FIELD PANEL	FEET PER SECOND	FIELD PANEL NO. WX	FORWARD REVERSE	FIBERGLASS REINFORCED PLASTIC	FSHS	FOLDING SHOWER SEAT	FOOT OR FEET	FOOTING	FIXTURE UNIT	FULL VOLTAGE NON-REVERSING	FULL VOLTAGE REVERSING	FORWARD	G, GND	GROUND	GAUGE	GALLON	GALVANIZED	GRAB BAR	GROOVED COUPLING	GROUND FAULT INTERRUPTER	GOUND FAULT RELAY	GLASS	GALLONS PER DAY	GALLONS PER HOUR	GALLONS PER MINUTE	GRATING	GALVANIZED STEEL PIPE	GATE VALVE	GRAVEL	GYPSON WALL BOARD	GYPSON	HORN OR HOWLER	HEADED ANCHOR STUD	HOSE BIB	HOLLOW CORE	HUB DRAIN	HEADER	HARDWARE	HYPALON ELASTIC SHEET ROOFING	HYDRAULIC GRADE LINE	HEIGHT	HANDHOLE	HIGH INTENSITY DISCHARGE	HOOK	HOLLOW METAL	HAND-OFF-AUTO	HAND-OFF-REMOTE	HORIZONTAL	HORSEPOWER	HIGH PRESSURE SODIUM	HIGH POINT	HOSE RACK	HARDENER	HOSE VALVE	HEATING, VENTILATING AND AIR CONDITIONING	HEADWALL	HIGH WATER LEVEL	IC	INTERRUPTING CAPACITY	ID	INSIDE DIAMETER	IE	INVERT ELEVATION	IF	INSIDE FACE	IG	INSULATING GLASS	IN	INCH	INCAND	INCANDESCENT	INJS	INJECTIONS	INST	INSTANTANEOUS	INSTM	INSTRUMENT, INSTRUMENTATION	INSUL	INSULATION	INV, INVIT	INVERT	IRRIG	IRRIGATION	ITG	INSULATED TEMPERED GLASS	IU	INTAKE UNIT	IW	IRRIGATION WELL	J, JB	JUNCTION BOX	JAN	JANITOR	JCT	JUNCTION	JT	JOINT	K	KEY INTERLOCK	KIP	THOUSAND POUNDS	KIT	KITCHEN	KSK	KITCHEN SINK	KV	KILOVOLTS	KVA	KILOVOLT AMPERES	KVAR	KILOVOLT AMPERES REACTIVE	KW	KILOWATT	L	ANGLE, LENGTH	LA	LIGHTNING ARRESTER	LAB	LABORATORY	LAM	LAMINATE	LAT	LATTITUDE	LAV	LAVATORY	LB	POUND	LB/CU FT	POUNDS PER CUBIC FOOT	LC	LIGHTING CONTACTOR	LF	LINEAR FEET	LG	LONG	LH	LEFT HAND	LHR	LEFT HAND REVERSE	LLH	LONG LEG HORIZONTAL	LLV	LONG LEG VERTICAL	LNTL	LINTEL	LONG	LONGITUDINAL	LOS	LOCK-OUT STOP PUSHBUTTON	LP	LIGHT POLE	LPT	LOW POINT	LR	LATCHING RELAY	LR	LOCAL-REMOTE	LR	LONG RADIUS	LS	LABORATORY SINK	LTG	LIGHTS OR LIGHTING	LWL	LOW WATER LEVEL	LYRS	LAYERS	M&BH	MOP AND BROOM HOLDER	MA	MANUAL-AUTO	MAS	MASONRY	MATL	MATERIAL	MAX	MAXIMUM	MB	MACHINE BOLT	MC	MASONRY CLEARANCE	MC	MODULATE-CLOSE	MCC	MOTOR CONTROL CENTER	MECH	MECHANICAL	MET	METAL	MFD	MANUFACTURED	MFR	MANUFACTURER	MGD	MILLION GALLONS PER DAY	MH	MANHOLE	MIN	MINIMUM	MIR	MIRROR	MISC	MISCELLANEOUS	MJ	MECHANICAL JOINT	MLO	MAIN LUGS ONLY	MMP	MECHANICAL MOUNTING PANEL	M.O.	MASONRY OPENING	MP	METAL PANEL	MPU	MULTIPURPOSE UNIT	MSH	MOTOR SPACE HEATER	RHR	RIGHT HAND REVERSE	MTD	MOUNTED	MTS	MANUAL TRANSFER SWITCH	MTS	MILL TYPE STEEL PIPE	MV	MERCURY VAPOR	MWS	MAXIMUM WATER SURFACE	N	NORTH	N/A	NOT APPLICABLE	N/C	NORMALLY CLOSED	N/O	NORMALLY OPEN	N, NEUT	NEUTRAL	NA	NON-AUTOMATIC	ND	NAPKIN DISPOSAL	NGS STA	NATIONAL GEODETIC SURVEY STATION	NIC	NOT IN CONTRACT	NO, #	NUMBER	NP	NON-PROTECTED	NPT	NATIONAL PIPE THREADS	NS	NON-SHRINK	NTS	NOT TO SCALE	O TO O	OUT TO OUT	OA	OVERALL	OC	ON CENTER	OC	OPEN-CLOSE	OCA	OPEN-CLOSE-AUTO	OCR	OPEN-CLOSE-REMOTE	OD	OUTSIDE DIAMETER	OF	OUTSIDE FACE	OL	OVERLOAD RELAY	OO	ON-OFF	OOA	ON-OFF-AUTO	OOR	ON-OFF-REMOTE	OP	OPAQUE PANEL	OPER	OPERATOR	OPNG	OPENING	OSC	OPEN-STOP-CLOSE	OSD	OPEN SITE DRAIN	OZ	OUNCE	P	PILASTER, PIPE	PAV	PAVER TILE	PB	PUSHBUTTON SWITCH	PC	PHOTOCELL	PC	POINT OF CURVE	PE	PLAIN END	PED	PEDESTAL	PEP	POLYETHYLENE PIPE	pH	HYDROGEN ION CONCENTRATION	PI	POINT OF INTERSECTION	PJF	PREMOULDED JOINT FILLER	PL	PLATE (STEEL)	PL	PROPERTY LINE	PLAS	PLASTIC	PLC	PROGRAMMABLE LOGIC CONTROLLER	PLC-X	PROGRAMMABLE LOGIC CONTROLLER	PLYWD	PLYWOOD	PNL	PANEL	PP	POWER POLE	PPL	POLYPROPYLENE LINED	PRCST	PRECAST	PREFAB	PREFABRICATION	PRES	PRESSURE	PRI	PRIMARY	PRM	PERMANENT REFERENCED MARKER	PROJ	PROJECTION	PROP	PROPERTY	PS	POLYCARBONATE SHEET	PSF	POUNDS PER SQUARE FOOT	PSI	POUNDS PER SQUARE INCH	PSIG	POUNDS PER SQUARE INCH, GAUGE	PT	POINT OF TANGENCY	PT	POTENTIAL TRANSFORMER	PT	PRESSURE TREATED	PTAC	PACKAGED TERMINAL AIR CONDITIONING	PTD	PAPER TOWEL DISPENSER	PV	PLUG VALVE	PVC	POLYVINYL CHLORIDE	PVI	POINT OF VERTICAL INTERSECTION	PVMT	PAVEMENT	PVT	POINT OF VERTICAL TANGENCY	QT	QUARRY TILE	R (RAD)	RADIUS	RC	REINFORCED CONCRETE	RCP	REINFORCED CONCRETE PIPE	RCPT	RECEPTACLE	RD	ROAD	RD	ROOF DRAIN	RDCR	REDUCER	RDW	REDWOOD	REF	REFER OR REFERENCE	REFR	REFRIGERATE, REFRIGERANT	REIN	REINFORCED, REINFORCING, REINFORCE	REQD	REQUIRED	RG	REFLECTIVE	RH	RIGHT HAND	RH	ROD HOLE	RHR	RIGHT HAND REVERSE	RL	RAIN LEADER	RL	RAISE LOWER	RLS	RUBBER LINED STEEL	RM	ROOM	ROL	RAISE-OFF-LOWER	RPM	REVOLUTIONS PER MINUTE	RS	RIGID STEEL	RST	REINFORCING STEEL	RTN	RETURN	RRUB	RADIAL RUBBER	R/W	RIGHT OF WAY	S	I-BEAM	S	SLOPE	S	SOUTH	S	SWITCH	SAN	SANITARY	SATC	SUSPENDED ACOUSTICAL TILE CEILING	SC	SHOWER CURTAIN	SCBA	SELF CONTAINED BREATHING APPARATUS	SCC	SOLID CORE	SCFM	STANDARD CUBIC FEED PER MINUTE	SCH	SCHEDULE	SCR	SHOWER CURTAIN ROD	SCU	SPEED CONTROL UNIT	SD	SOAP DISPENSER	SDMH	STORM DRAIN MANHOLE	SDWK	SIDEWALK	SEC	SECONDARY	SECT	SECTION	SED	SEDIMENTATION	SEW	SEWAGE	SF	SLOWER-FASTER	SF	SQUARE FEET	SG	LAMINATED SAFETY GLASS	SGWB	SUSPENDED GYPSON WALL BOARD	SH	SHOWER	SH (SHT)	SHEET	SHA	SURFACE HARDENING AGENT	SHS	SOLIDS HANDLING SYSTEM	SIM	SIMILAR	SJUCUD	ST. JOHNS COUNTY UTILITY DEPARTMENT	SMH	STORMWATER MANHOLE	SOLN	SOLUTION	SP	SPACE OR SPACES	SPA	SPACING	SPEC, SPECS	SPECIFICATIONS	SPEC'D.	SPECIFIED	SPLY	SUPPLY	SQ	SQUARE	SQ FT	SQUARE FOOT, FEET	SQ IN	SQUARE INCH	SR	SHORT RADIUS	SS	START-STOP	SS, SST	STAINLESS STEEL	SSH	SAFETY SHOWER	SSK	SERVICE SINK	STA	STATUS	STD	STANDARD	STIF	STIFFENER	STIRR	STIRRUP	STL	STEEL	ST	STRAIGHT	STRL	STRUCTURAL	STRUCT	STRUCTURE	SUSP	SUSPENDED	SV	SOLENOID VALVE	SYMM	SYMMETRICAL	T	THERMOSTAT	T&B	TOP AND BOTTOM	T&G	TONGUE AND GROOVE	T/	TOP OF	TAN	TANGENT	TB	TERMINAL BOARD	TB	TOWEL BAR	TBG	TUBING	TC	TIME TO CLOSE	TCAE	TIME CLOSE AFTER ENERGIZATION	TCL2	TOTAL CHLORINE RESIDUAL	TDH	TOTAL DYNAMIC HEAD	TDR	TIME DELAY RELAY	TECH	TECHNICAL	TEL	TELEPHONE	TEMP	TEMPORARY	TF	TOP FACE	TFG	TEMPERED FLOAT GLASS	THD	THREAD	THK	THICKNESS	THRU	THROUGH	TJB	TERMINAL JUNCTION BOX	TL	TEFLON LINE PIPE	TO	TIME TO OPEN	TOAD	TOILET TISSURE DISPENSER	TOAE	TIME OPEN AFTER ENERGIZATION	TP	TURNING POINT	TRANS	TRANSFORMER	TRANSV	TRANSVERSE	TDR	TREAD	TS	TUBE STEEL	TTD	TOILET TISSURE DISPENSER	TU-X	TREATMENT UNIT NO. X	TURB	TURBIDITY	TYP	TYPICAL	U ON	UNLESS OTHERWISE NOTED	UBC	UNIFORM BUILDING CODE	UH	UNIT HEATER	UR	URNAL	UVR	UNDER VOLTAGE RELAY	V	VALVE	V	VENT	V	VOLT	V	VOLTMETER, VOLTS	VB	VAPOR BARRIER	VC	VERTICAL CURVE	VCP	VITRIFIED CLAY PIPE	VDR	VERTICLE DRYING RACK	VERT	VERTICAL	VIB	VIBRATION	VP	VENEER PLASTER	VPC	POINT OF VERTICAL CURVATURE	VPI	POINT OF VERTICAL INTERSECTION	VPS	VENEER PLASTER SYSTEM	VPT	POINT OF VERTICAL TANGENT	VT	VINYL TILE	VTR	VENT THRU ROOF	W	WEST	W	WIDE FLANGE (BEAM)	W/	WITH	WC	WATER CLOSET	WD	WOOD	WG	WIRE GLASS	WH	WATER HEATER	WH	WATTHOUR METER	WHD	WATTHOUR DEMAND METER	WP	WATERPROOF	WP	WEATHERPROOF	WR	WASTE RECEPTACLE	WS	WATER SURFACE	WS	WATERSTOP	WS	WELDED STEEL	WTP	WATER TREATMENT PLANT	WTR	WATER	WU	WALL URN	WWTP	WASTEWATER TREATMENT PLANT
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NOTES:
1. THIS IS A STANDARD LEGEND SHEET, THEREFORE SOME ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE DRAWINGS.
2. CONTACT ENGINEER FOR ABBREVIATIONS NOT USED.

Jacobs

GENERAL ABBREVIATIONS

200 W FORSYTH STREET, SUITE 1520
JACKSONVILLE, FLORIDA 32202
E60000072
Lawrence Bradley Gunn, FL PE 65967

NORTHWEST WELL NO. 7
WELLHEAD AND SITE
ST. JOHNS COUNTY UTILITY DEPARTMENT
ST. AUGUSTINE, FLORIDA

NTS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE	MAY 2021
PROJ	EGXM1300
DWG	G-03
SHEET	3 of 26

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I. TRULLENQUE
N. PATTERSON
DR
REVISION
CHK
APVD
BY
APVD

GENERAL SITE NOTES:

- SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS ARE JULY, 2020 BASE MAPS PROVIDED BY ST. JOHNS COUNTY LAND MANAGEMENT SYSTEMS SURVEYING AND MAPPING DIVISION AND THE PRIOR SITE PREP PACKAGE. ADDITIONAL MAPPING HAS BEEN ADDED FROM AS-BUILT DATA FROM CDM SMITH. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
- EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY-LINED.
- HORIZONTAL DATUM: STATE PLANE COORDINATES, FLORIDA EAST ZONE, U.S. SURVEY FEET, NAD 83 / 90.
- VERTICAL DATUM: NAVD 88, FEET.
- MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
- COORDINATES AND DIMENSIONS SHOWN FOR ROAD IMPROVEMENTS ARE TO EDGE OF ROAD.
- CONTRACTOR SHALL COORDINATE WITH SJCUD FOR THE LOCATION OF A STAGING AREA FOR CONTRACTOR'S EMPLOYEE PARKING, CONTRACTOR'S TRAILERS AND ON-SITE STORAGE OF MATERIALS.
- PROVIDE TEMPORARY FENCING AS NECESSARY TO MAINTAIN SECURITY AT ALL TIMES.
- ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN.
- SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
- UNLESS SHOWN OTHERWISE, ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE SHALL BE COVERED WITH GRASS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION. EROSION CONTROL DEVICES SHOWN ARE THE MINIMUM REQUIRED.
- CONTRACTOR SHALL TAKE ALL OTHER MEASURES TO POSITIVELY PRECLUDE EROSION MATERIALS FROM LEAVING THE SITE.

YARD PIPING AND UTILITIES NOTES:

- EXISTING UNDERGROUND UTILITIES OBTAINED FROM AS-BUILTS AND FROM FIELD SURVEY. CONTRACTOR SHALL FIELD VERIFY DEPTH AND LOCATION PRIOR TO EXCAVATION. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
- EXISTING PIPING AND EQUIPMENT ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW PIPING AND EQUIPMENT ARE SHOWN HEAVY-LINED.
- UNLESS OTHERWISE SHOWN ALL PIPING SHALL HAVE A MINIMUM OF 30" OF COVER.
- ALL PIPES SHALL HAVE A CONSTANT SLOPE BETWEEN INVERT ELEVATIONS UNLESS A FITTING IS SHOWN.
- ALL NEW WATER PIPES MUST BE PROPERLY FLUSHED, DISINFECTED, PRESSURE TESTED, AS SPECIFIED.
- FOR TRENCHING AND BACKFILL, SEE (3123-110) .
- FOR SURFACE RESTORATION OF GRASS, SEE SPECIFICATION 32 92 00, TURF AND GRASSES.

CIVIL LEGEND

- SPOT ELEVATION
- CONTOUR LINE
- EMBANKMENT AND SLOPE
- DRAINAGeway OR DITCH
- ELECTRICAL MANHOLE
- ELECTRIC HANDHOLE
- POST OR GUARD POST
- GUY ANCHOR
- UTILITY POLE
- LIGHT POLE
- BENCHMARK
- SURVEY CONTROL POINT OR POINT OF INTERSECTION
- DIRECTIONAL FLOW
- GRADE SLOPE
- SINGLE SWING GATE
- DOUBLE SWING GATE
- WIRE FIELD FENCE
- CULVERT
- PROPERTY LINE
- CENTER LINE, BUILDING, ROAD, ETC.
- STAGING OR WORK AREA LIMITS
- SILT FENCE
- CONSTRUCTION ENTRANCE
- STRUCTURE, BUILDING OR FACILITY LOCATION POINT - COORDINATES
- DEMOLITION
- STRUCTURE, BUILDING OR FACILITY
- LIMEROCK SURFACING

SURVEY LEGEND

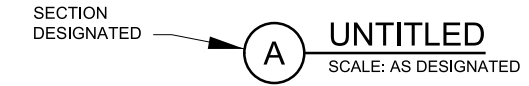
- VERTICAL CONTROL/BENCHMARK
- ELEVATION SHOT
- VERTICAL PIPE
- WATER VALVE
- WATER METER
- UNDERGROUND MARKER-POST
- CONCRETE UTILITY POLE
- CONCRETE UTILITY POLE WITH GUY ANCHOR
- UNDERGROUND MARKINGS-WATER
- UNDERGROUND MARKINGS-PIN FLAG
- OFFICIAL RECORDS
- PAGE(S)
- INVERT
- MITERED END SECTION
- REINFORCED CONCRETE PIPE
- POLYVINYL CHLORIDE PIPE
- CORRUGATED METAL PIPE
- TREE LINE
- RIGHT OF WAY

SECTION AND DETAIL IDENTIFICATION

SECTION AND DETAIL DESIGNATORS



ON DRAWING WHERE SECTION IS DRAWN:



DESIGN DETAIL DESIGNATION



200 W FORSYTH STREET, SUITE 1520
JACKSONVILLE, FLORIDA 32202
EG0000072
Richard Thomas Morrison FL PE 67713

NORTHWEST WELL NO. 7
WELLHEAD AND SITE
ST. JOHNS COUNTY UTILITY DEPARTMENT
ST. AUGUSTINE, FLORIDA

Jacobs

GENERAL
CIVIL AND YARD PIPING
LEGENDS AND NOTES

NTS	
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MAY 2021
PROJ	EGXM1300
DWG	G-04
SHEET	4 of 26

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R. MORRISON
APVD
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N. PATTERSON
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DR

REVISION

NO.

DATE

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DATE

DESIGN CRITERIA

- APPLICABLE CODE: FLORIDA BUILDING CODE SEVENTH EDITION (2020), AS AMENDED BY APPLICABLE LOCAL AGENCIES.
- REFER TO THE DRAWINGS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS.
- ALL LOADS SHOWN ARE SERVICE LEVEL (UNFACTORED) UNLESS SPECIFICALLY NOTED OTHERWISE.
- DEAD LOADS:
 - SELF WEIGHT
- LIVE LOADS:
 - SLAB ON GRADE = 300 PSF
- WIND LOADS:

BASIC WIND SPEED	= 138 MPH (3 SECOND GUST)
Vult	= 107 MPH
Vasd	= C
EXPOSURE CATEGORY	= III
RISK CATEGORY	= NOT APPLICABLE
ENCLOSURE CLASSIFICATION	= NOT APPLICABLE
INTERNAL PRESSURE COEFFICIENT, GCpi	= NOT APPLICABLE
- SNOW LOAD:

GROUND SNOW LOAD, Pg	= 0 PSF
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- SEISMIC CRITERIA:

RISK CATEGORY	= III
MAPPED SPECTRAL RESPONSE ACCELERATIONS	
Ss	= 0.091g
S1	= 0.048g
SITE CLASS	= D (ASSUMED)
DESIGN SPECTRAL RESPONSE ACCELERATIONS	
SDs	= 0.097g
SD1	= 0.076g
SEISMIC DESIGN CATEGORY	= B
- THE FOLLOWING ARE NOT APPLICABLE:

DESIGN BASE SHEAR	
SEISMIC RESPONSE COEFFICIENT, Cs	
RESPONSE MODIFICATION COEFFICIENT, R	
ANALYSIS PROCEDURE USED	

FORMWORK, SHORING, AND BRACING

- STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. DESIGN SHOWN DOES NOT INCLUDE NECESSARY COMPONENTS OR EQUIPMENT FOR STABILITY OF THE STRUCTURES DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.

FOUNDATIONS

- SOIL DESIGN PARAMETERS (ASSUMED):
 - NET ALLOWABLE SOIL BEARING PRESSURE = 1000 PSF
- FOUNDATION DESIGN WAS BASED ON ASSUMED SOIL BEARING PRESSURE INDICATED ABOVE.
 - OWNER WILL HIRE GEOTECHNICAL FIRM TO TEST SUBGRADE SOILS AND CONFIRM THE ASSUMED BEARING PRESSURE.
 - NOTIFY ENGINEER IMMEDIATELY IF THE INSITU SOIL BEARING PRESSURE IS LOWER THAN THE ASSUMED VALUE PRIOR TO CONSTRUCTION.
- SLABS-ON-GRADE SHALL BEAR ON 6 INCHES OF COMPACTED GRANULAR FILL.
- DO NOT DAMAGE EXISTING STRUCTURES IN THE EXECUTION OF WORK.

GENERAL INFORMATION

- FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS: PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
- DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE INDIVIDUALLY CALLED OUT.
- DO NOT CUT OR MODIFY STRUCTURAL MEMBERS UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.
- VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT ENGINEER IS GUARANTOR OF CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR THE COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, OR SAFETY AT THE JOB SITE.

CONCRETE REINFORCING

- REINFORCING STEEL = ASTM A615, GRADE 60.
- FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
- CONCRETE COVER FOR REINFORCING, UNLESS SHOWN OTHERWISE, SHALL BE:

WHEN PLACED ON GROUND	= 3"
OTHER CONCRETE SURFACE	= 2"
- 90 DEGREE BENDS, UNLESS OTHERWISE SHOWN, SHALL BE ACI 318 STANDARD HOOKS.
- REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

CONCRETE DESIGN STRENGTH = 4,000 PSI MIN AT 28 DAYS GRADE 60 REINFORCING STEEL					
BAR SIZE	#3	#4	#5	#6	
LAP SPLICE LENGTH					
TOP BAR	1'-4"	1'-8"	2'-0"	2'-5"	
OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	
EMBEDMENT LENGTH					
TOP BAR	1'-0"	1'-3"	1'-7"	1'-10"	
OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	

- TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 INCHES OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

CAST IN PLACE CONCRETE

- CONCRETE MIX DESIGN SHALL BE IN ACCORDANCE WITH ACI 301-10:
 - CONCRETE:
 - MINIMUM COMPRESSIVE STRENGTH f_c 4,000 PSI AT 28 DAYS.
 - W/CM RATIO SHALL NOT EXCEED 0.45.
 - SLUMP SHALL BE 4 ± 1 INCH.
 - EXPOSURE CLASS AND CATEGORY F1S0W0C0.
 - PORTLAND CEMENT SHALL CONFORM TO ASTM C150 TYPE I OR II.
 - AGGREGATE SHALL COMPLY WITH ASTM C33, CLASS DESIGNATION 4M AND NON-REACTIVE AS DETERMINED USING ONE OF THE FOLLOWING:
 - ASTM C1260
 - ASTM C1293
 - ASTM 1567
 - SUBMIT DOCUMENTATION OF AVERAGE STRENGTH FOR EACH PROPOSED MIX DESIGN IN ACCORDANCE WITH ACI 301.
 - STRENGTH TESTS:
 - ONE SPECIMEN AT 7 DAYS FOR INFORMATION.
 - TWO 6 INCH DIAMETER OR THREE 4 INCH DIAMETER TEST SPECIMENS AT 28 DAYS FOR ACCEPTANCE.
 - PROVIDE MINIMUM OF ONE SPARE TEST SPECIMEN PER SAMPLE.
 - PROVIDE TROWEL FINISH UNLESS OTHERWISE NOTED. DO NOT SPRINKLE WATER OR CEMENT ON SURFACE WHEN FINISHING.
 - APPLY ASTM C309 TYPE 1 OR 1-D CURING COMPOUND IN ACCORDANCE WITH MANUFACTURER'S WRITTEN RECOMMENDATIONS. SUPER DIAMOND CLEAR VOX BY EUCLID CHEMICAL COMPANY..
 - CHAMFER EXPOSED EDGES OF CONCRETE 3/4 INCH UNLESS OTHERWISE NOTED.
 - CONCRETE REPAIR: PATCH SURFACE DEFECTS THAT INCLUDE HONEYCOMBING, ROCK POCKETS, INDENTATIONS AND SURFACE Voids WITH SIKATOP 123 PLUS BY SIKA CORP.
- FINISH SLAB: BULL FLOAT WITH WOOD FLOAT, WOOD TROWEL, AND LIGHTLY TROWEL WITH STEEL TROWEL. FINISH WITH BROOM TO OBTAIN NONSKID SURFACE.

STRUCTURAL STEEL AND METAL FABRICATIONS

- STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

W-SHAPES	A992
MISCELLANEOUS SHAPES INCLUDING ANGLES, CHANNELS, PLATES, ETC.	A36
HOLLOW STRUCTURAL SECTIONS (HSS)	A1085
STEEL PIPE	A53, GRADE B
STAINLESS STEEL SHAPES	A276
- ALUMINUM SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

STRUCTURAL SHAPES	B308
PLATES	B209
- STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, CURRENT EDITION, AND CURRENT OSHA STANDARDS.
- FASTENERS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO THE FOLLOWING ASTM STANDARDS EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE:

UNLESS SHOWN OTHERWISE	A325-N
ANCHOR BOLTS (AB)	
STAINLESS STEEL	F593, AISI TYPE 316, CONDITION CW
STEEL OR GALVANIZED STEEL	F1554, GR 36 / A153
MACHINE BOLTS (MB)	
STEEL	A307
STAINLESS STEEL	F593, AISI TYPE 316, CONDITION CW
GALVANIZED STEEL	A307 / A153
ALUMINUM	F468, ALLOY 2024-T4
- ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE CLEAN AND FREE OF OIL, DIRT AND PAINT.
- NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STRUCTURAL STEEL IS PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER.

WELDING

- WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS):

D1.1, STRUCTURAL WELDING CODE	STEEL
D1.2, STRUCTURAL WELDING CODE	ALUMINUM
D1.3, STRUCTURAL WELDING CODE	SHEET STEEL
D1.4, STRUCTURAL WELDING CODE	REINFORCING STEEL
D1.6, STRUCTURAL WELDING CODE	STAINLESS STEEL
- REPAIR WELDS FOUND DEFECTIVE IN ACCORDANCE WITH AWS D1.1 SECTION 5.26.
- USE INTERMITTENT WELDS AT FIELD WELDS OF EMBED PLATES AND ANGLES TO AVOID SPALLING OR CRACKING OF THE EXISTING CONCRETE.
- BUTT JOINT WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

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E6000072 AA001992
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GENERAL
STRUCTURAL NOTES

NORTHWEST WELL NO. 7
WELLHEAD AND SITE
ST. JOHNS COUNTY UTILITY DEPARTMENT
ST. AUGUSTINE, FLORIDA

NTS

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE MAY 2021

PROJ EGXM1300

DWG G-05

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MECHANICAL LEGEND AND NOTES

GENERAL PIPING NOTES

LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.

SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.

LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. CONTRACTOR SHALL DESIGN SUPPORTS AS SPECIFIED.

ALL JOINTS SHALL BE WATERTIGHT. WALL PIPES SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.

ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.

SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.

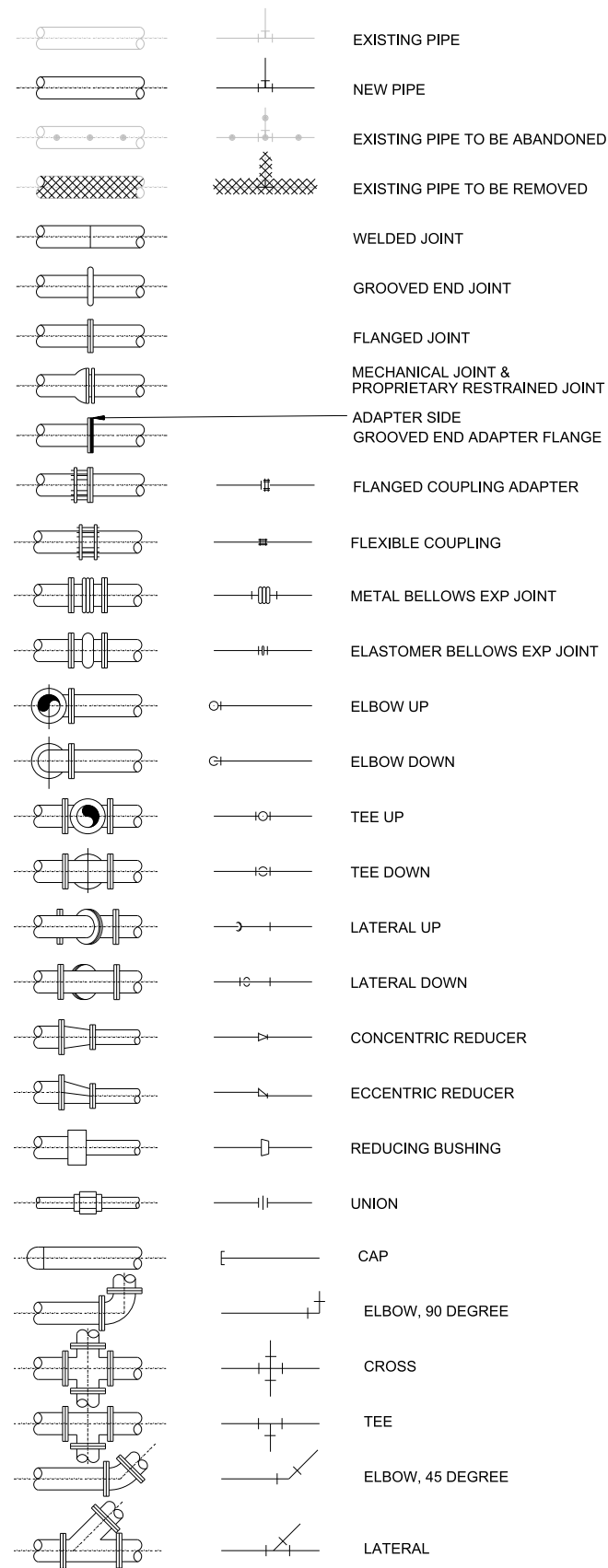
NUMBER AND LOCATION OF UNIONS SHOWN ON THE DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.

WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.

CONTRACTOR SHALL SUPPLY ALL HOSE RACKS SHOWN ON DRAWINGS BUT SHALL LOCATE ALL HOSE RACKS PER OWNERS DIRECTIONS.

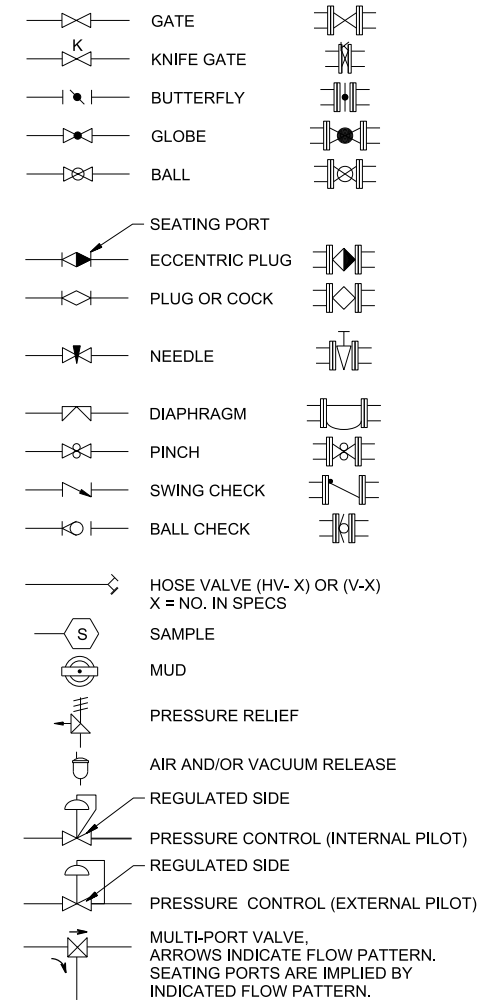
PIPE AND FITTING SYMBOLS

DOUBLE LINE SINGLE LINE



VALVE SYMBOLS

SINGLE LINE DOUBLE LINE



NOTES:

- THIS IS A STANDARD LEGEND SHEET. SOME FITTINGS OR VALVES MAY APPEAR ON THIS SHEET AND NOT ON THE DRAWINGS. FOR ANY FITTINGS OR VALVES NOT SHOWN ON THIS DRAWING, CONTACT THE ENGINEER
- ONLY FLANGED END CONNECTIONS ARE SHOWN HERE FOR DOUBLE LINE FITTINGS. FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS.
- SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
- EXISTING PIPE AND EQUIPMENT IS SHOWN LIGHT-LINED AND/OR SCREENED AND IS NOTED AS EXISTING. NEW PIPING AND EQUIPMENT IS SHOWN HEAVY-LINED.

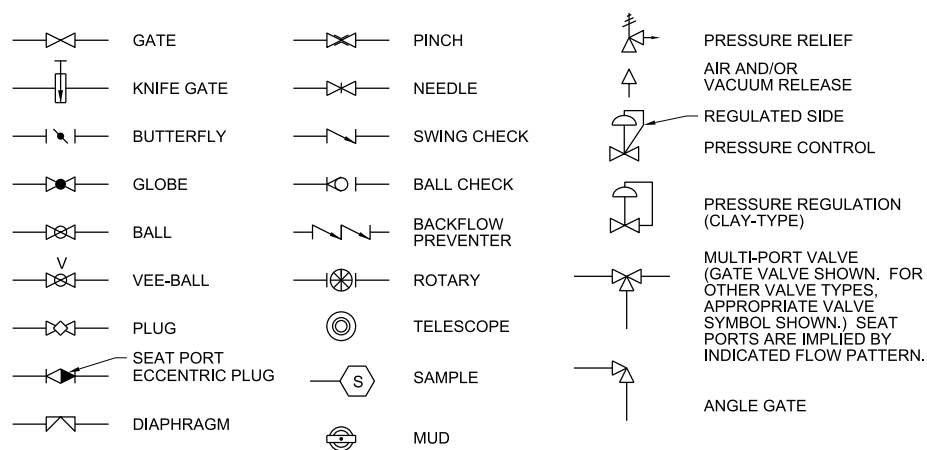
200 W FORSYTH STREET, SUITE 1520 JACKSONVILLE, FLORIDA 32202 E60000072 Lawrence Bradley Gunn PE FL 65967		NORTHWEST WELL NO. 7 WELLHEAD AND SITE ST. JOHNS COUNTY UTILITY DEPARTMENT ST. AUGUSTINE, FLORIDA		L GUNN DR		L GUNN CHK		L GUNN APVD	
GENERAL		PROCESS MECHANICAL LEGENDS AND NOTES		NO. DATE		REVISION		BY APVD	
NTS		VERIFY SCALE		BAR IS ONE INCH ON ORIGINAL DRAWING.		DATE		MAY 2021	
PROJ		EGXM1300		DWG		G-05		SHEET	
6 of 26		PLOT DATE: 5/21/2021		PLOT TIME: 12:26:14 PM		FILENAME: 0-G-006_EGXM1300.dgn		SPWURL	

BID DOCUMENTS

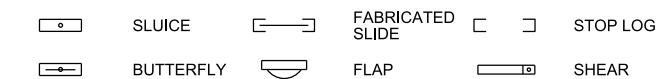
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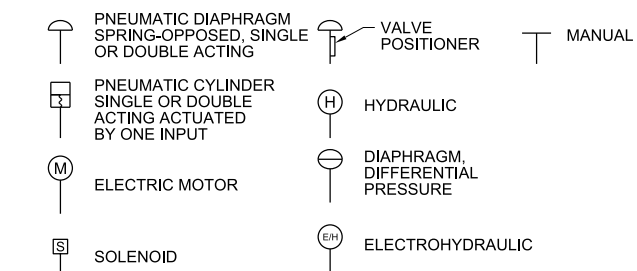
VALVE SYMBOLS



GATE SYMBOLS



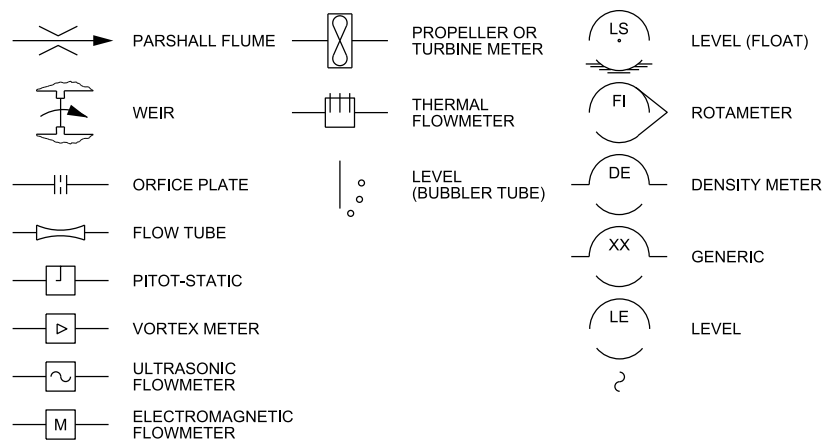
ACTUATOR SYMBOLS



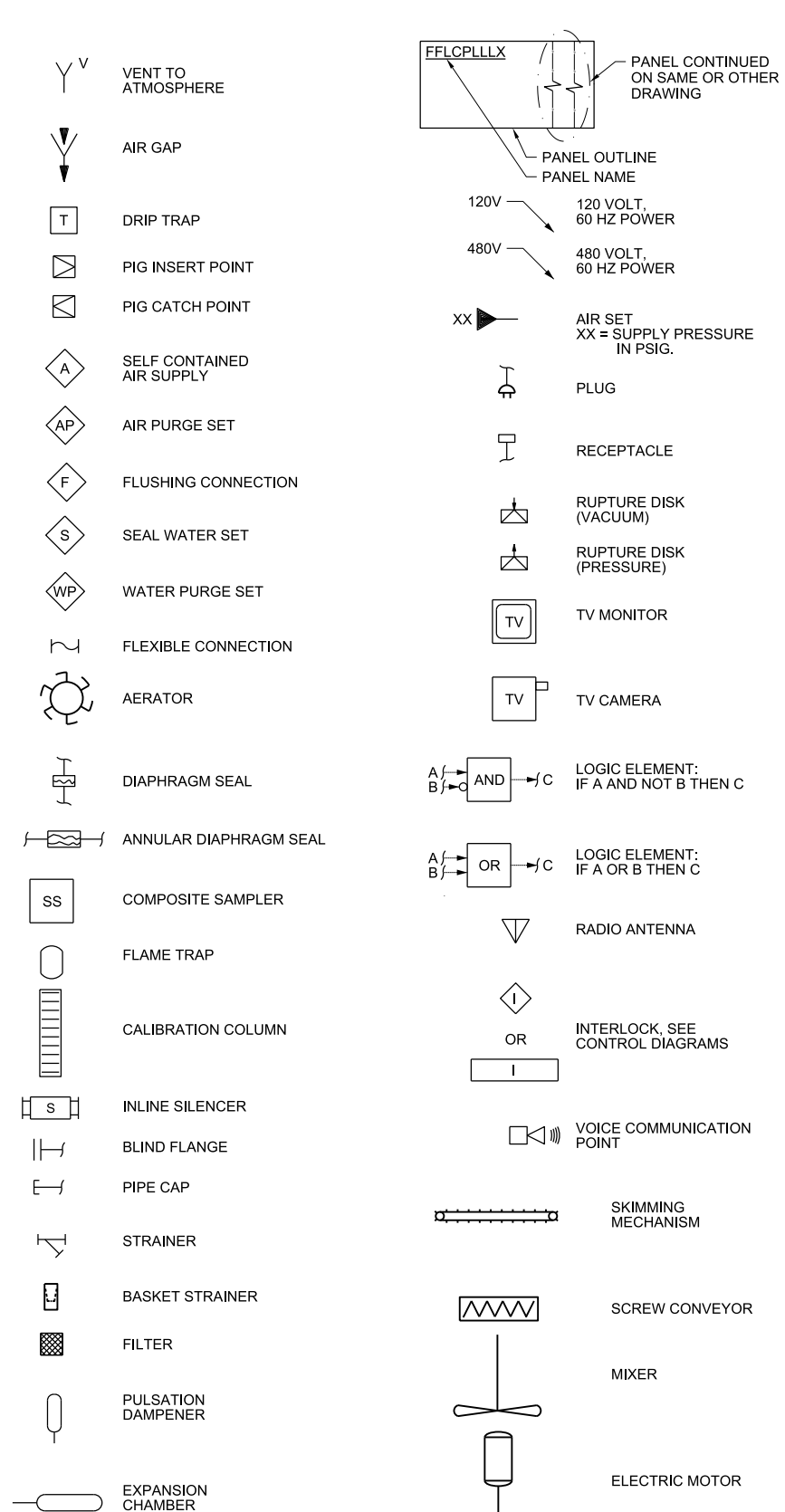
NOTE: ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL, OR HYDRAULIC)

XX: FO FAIL OPEN
FC FAIL CLOSED
FLP FAIL TO LAST POSITION

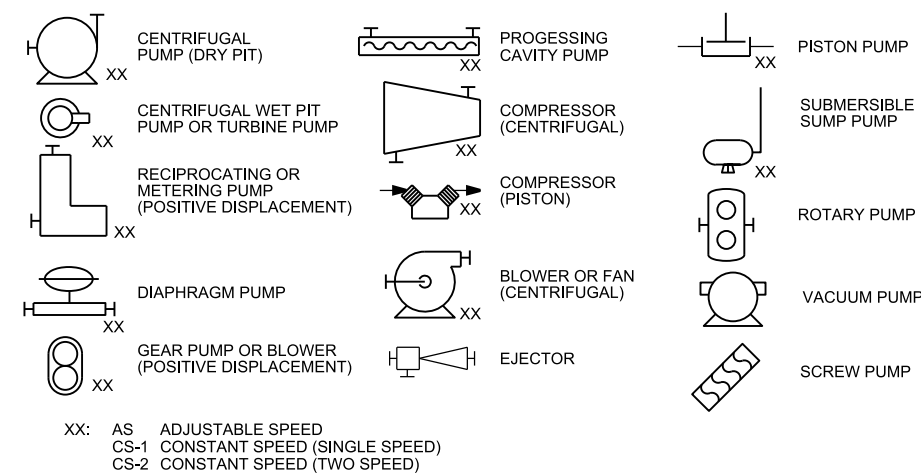
PRIMARY ELEMENT SYMBOLS



MISCELLANEOUS SYMBOLS



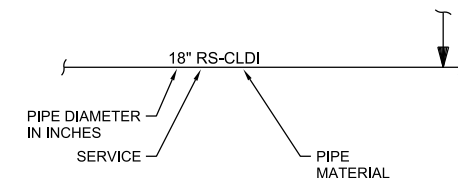
PUMP AND COMPRESSOR SYMBOLS



XX: AS ADJUSTABLE SPEED
CS-1 CONSTANT SPEED (SINGLE SPEED)
CS-2 CONSTANT SPEED (TWO SPEED)

LINE SIZE AND MATERIAL IDENTIFICATION

(FOR REFERENCE ONLY. SEE SITE AND MECHANICAL DRAWINGS)



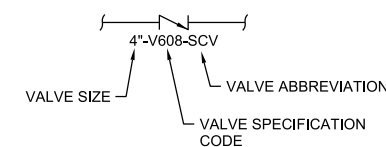
CI	CAST IRON
CISP	CAST IRON SOIL PIPE
CLDI	CEMENT LINED DUCTILE IRON
CLSTL	CEMENT LINED STEEL
CU	COPPER
FRP	FIBERGLASS REINFORCED PLASTIC
PE	POLYETHYLENE TUBING
PVC	POLYVINYL CHLORIDE
SST	STAINLESS STEEL
STL	STEEL

FLOW STREAM IDENTIFICATION

- DR DRAIN
- IRR IRRIGATION
- RW RAW WATER
- V VENT
- W1 NO. 1 WATER (POTABLE)
- W3 NO. 3 WATER (NON-POTABLE)

VALVE IDENTIFICATION

(FOR REFERENCE ONLY. SEE SITE AND MECHANICAL DRAWINGS)



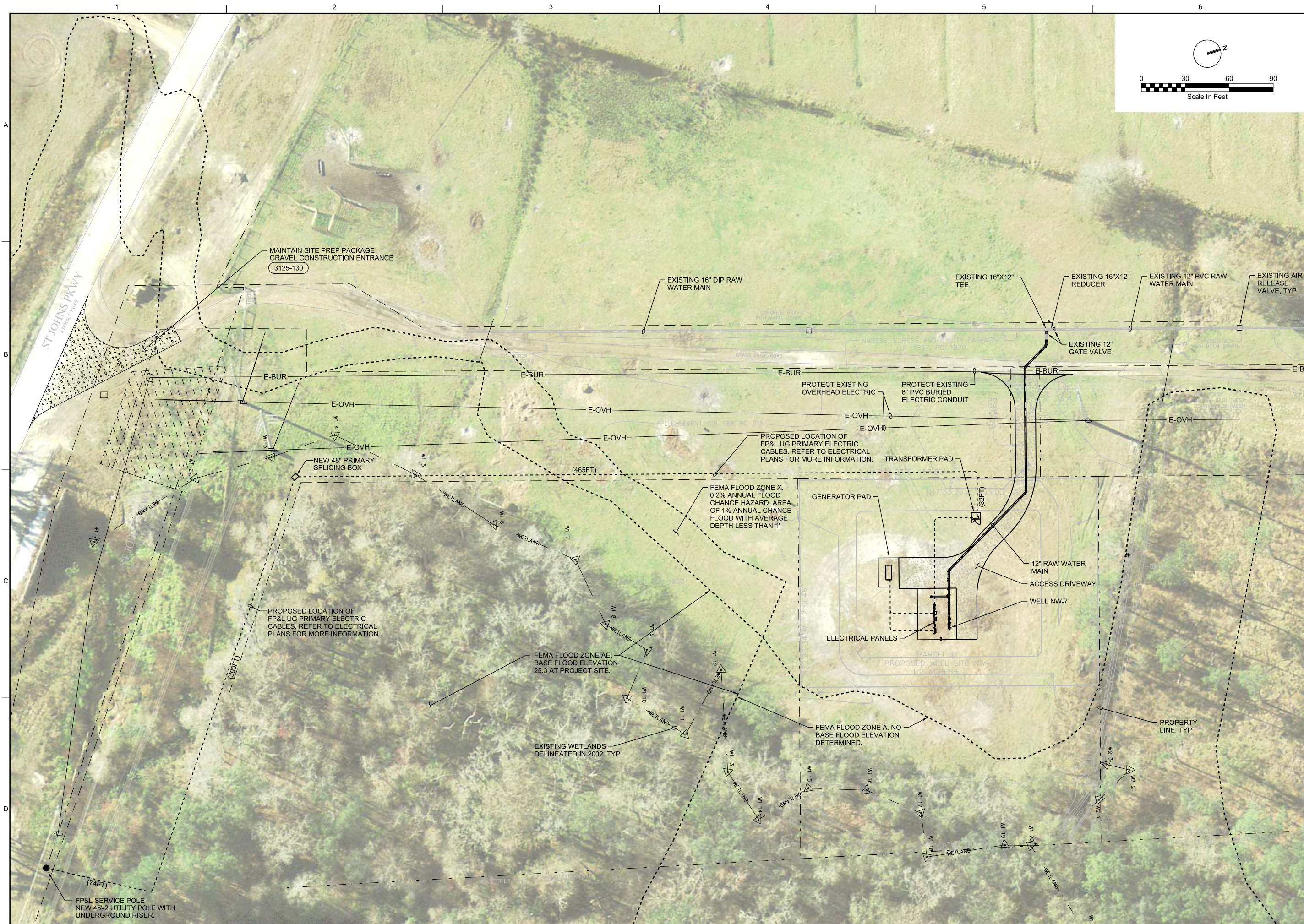
ABBREVIATIONS:

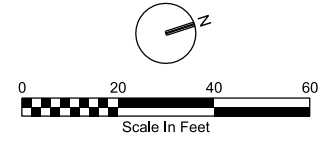
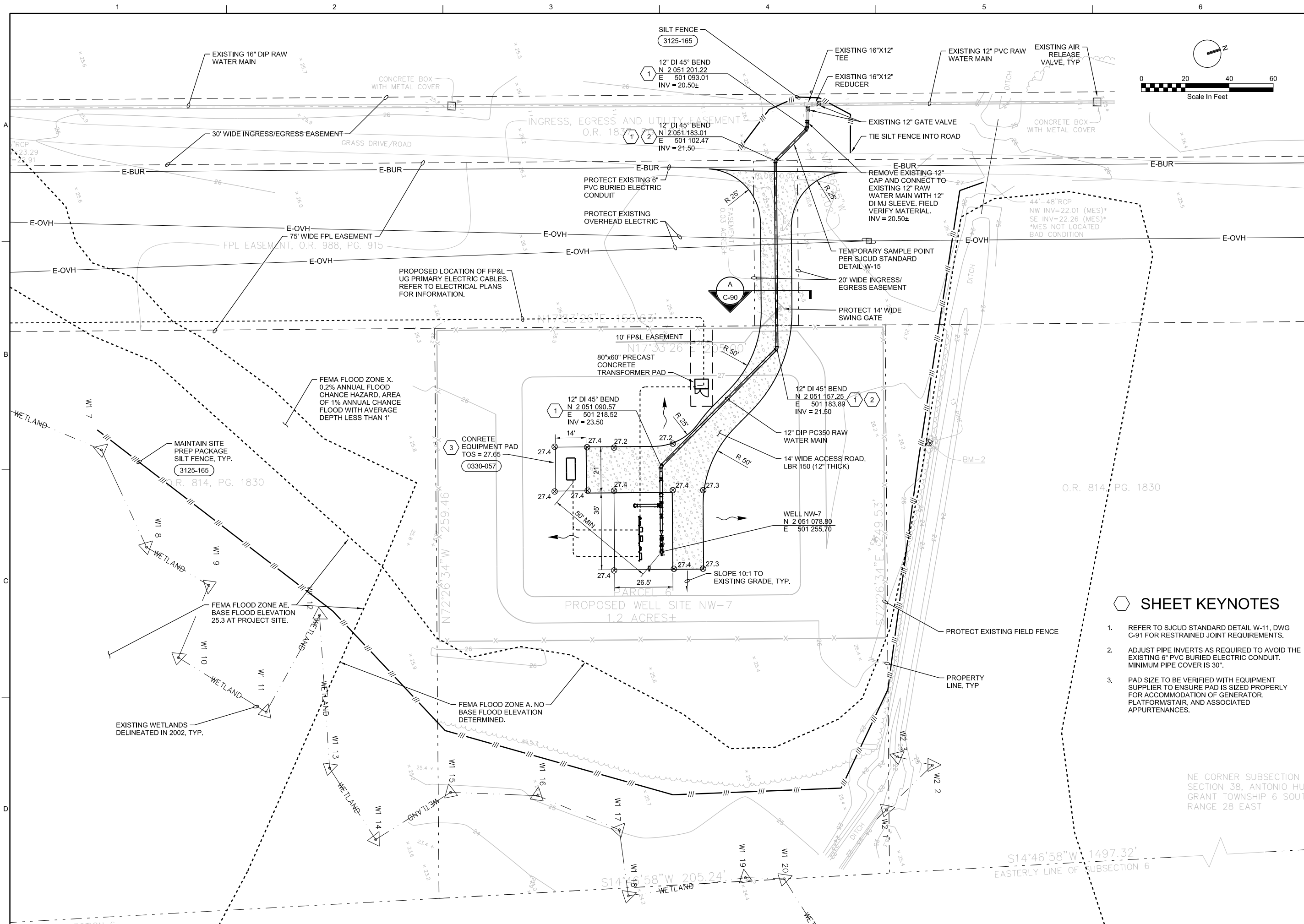
- GATE -GV
- KNIFE GATE -KV
- BUTTERFLY -BFV
- GLOBE -GV
- BALL -BV
- VEE-BALL -VV
- PLUG -PV
- EFFECTRIC PLUG -EPV
- DIAPHRAGM -DV
- KEYLOCK VALVE -KLV
- PINCH -PNV
- NEEDLE -NV
- SWING-CHECK -SCV
- CHECK VALVE -CV
- BALL CHECK -BCV
- BACKFLOW PREVENTOR -BFP

Jacobs

GENERAL
INSTRUMENTATION AND CONTROL
LEGEND SHEET 2

NTS	
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING.	
DATE	MAY 2021
PROJ	EGXM1300
DWG	G-09
SHEET	9 of 26





- SHEET KEYNOTES**
- REFER TO SJCD STANDARD DETAIL W-11, DWG C-91 FOR RESTRAINED JOINT REQUIREMENTS.
 - ADJUST PIPE INVERTS AS REQUIRED TO AVOID THE EXISTING 6" PVC BURIED ELECTRIC CONDUIT. MINIMUM PIPE COVER IS 30".
 - PAD SIZE TO BE VERIFIED WITH EQUIPMENT SUPPLIER TO ENSURE PAD IS SIZED PROPERLY FOR ACCOMMODATION OF GENERATOR, PLATFORM/STAIR, AND ASSOCIATED APPURTENANCES.

200 W FORSYTH STREET, SUITE 1520 JACKSONVILLE, FLORIDA 32202 E60000072 Richard Thomas Morrison FL PE 67713		NORTHWEST WELL NO. 7 WELLHEAD AND SITE ST. JOHNS COUNTY UTILITY DEPARTMENT ST. AUGUSTINE, FLORIDA	
AS NOTED		VERIFY SCALE	
DATE MAY 2021		PROJ EGXM1300	
DWG C-02		SHEET 11 of 26	

JACOBS

CIVIL
ENLARGED SITE PLAN

NE CORNER SUBSECTION 6
SECTION 38, ANTONIO HUE
GRANT TOWNSHIP 6 SOUTH
RANGE 28 EAST

SPWURL \\\denpwp01\d\$pwic\$working\876400\1031395_60510-C-002_EGXM1300.dgn

FILENAME: 0510-C-002_EGXM1300.dgn

PLOT DATE: 5/21/2021

PLOT TIME: 12:25:09 PM

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APVD BY: R. MORRISON
CHK: B. DYKES
DR: B. DYKES

NO. DATE
DGN

REVISION

APVD

BY

APVD

NO. DATE

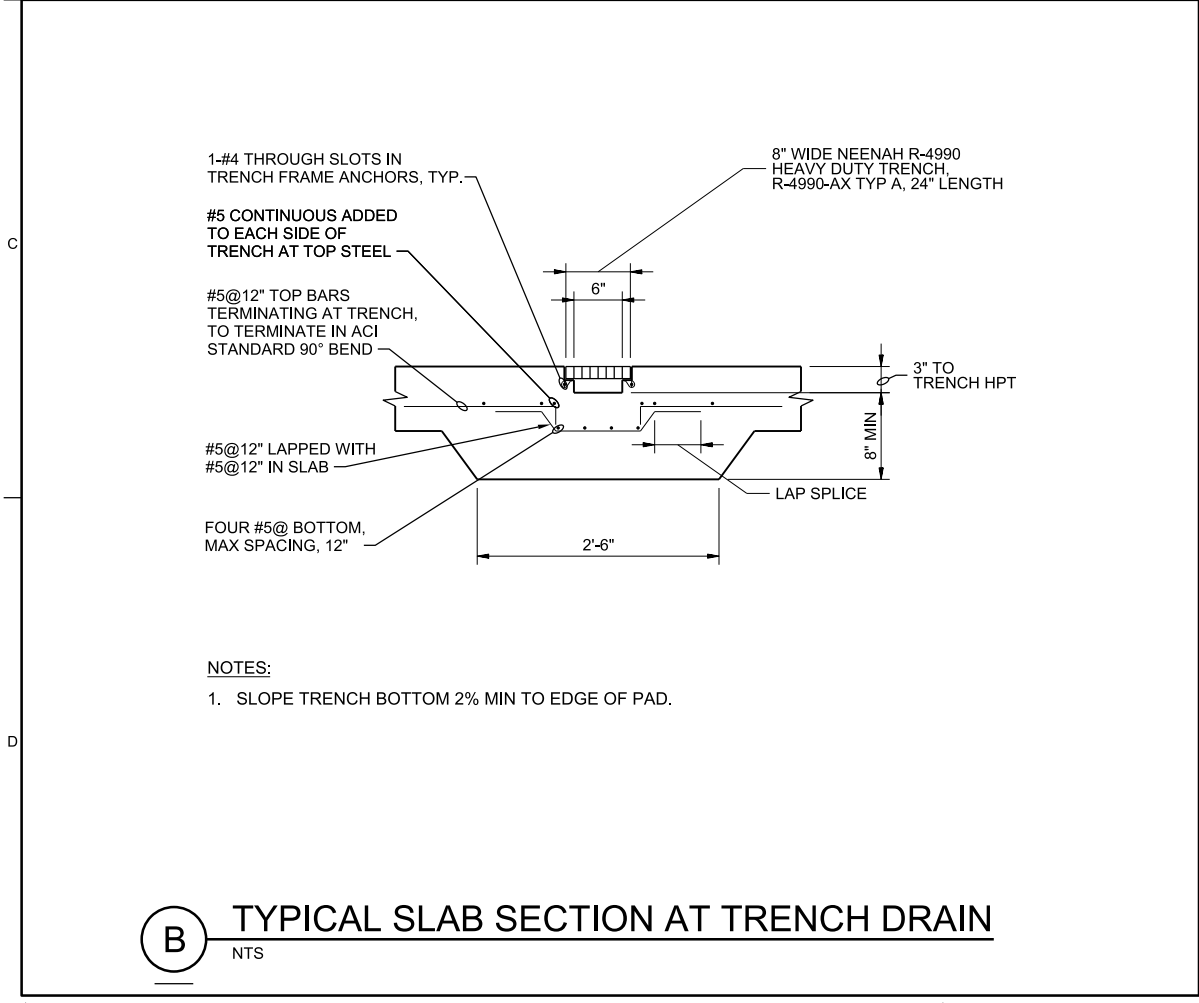
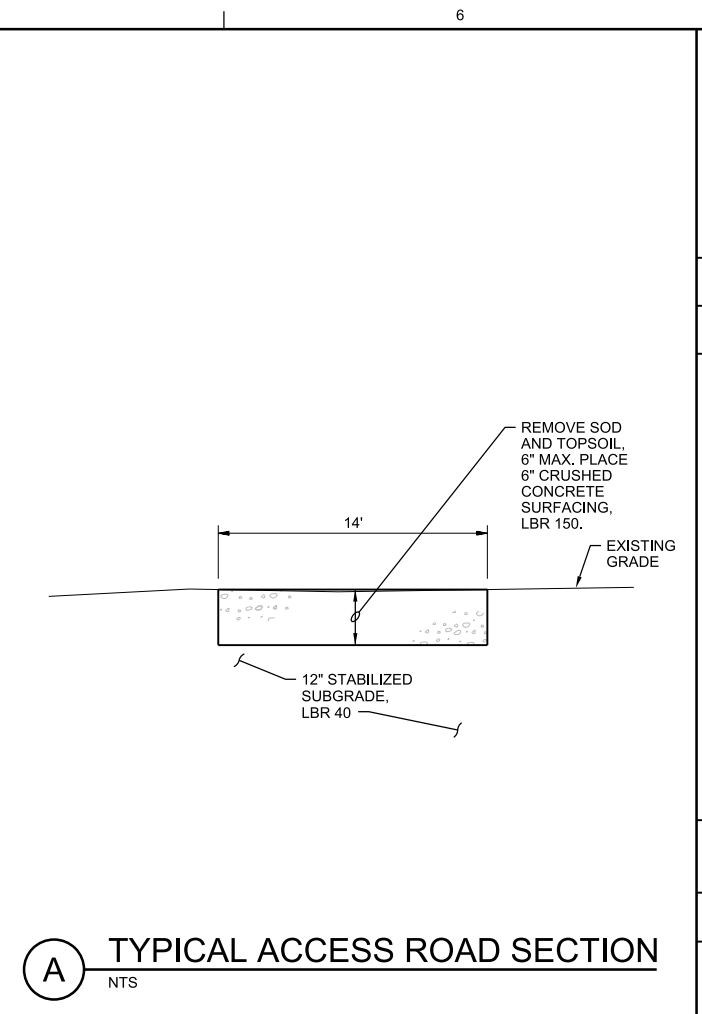
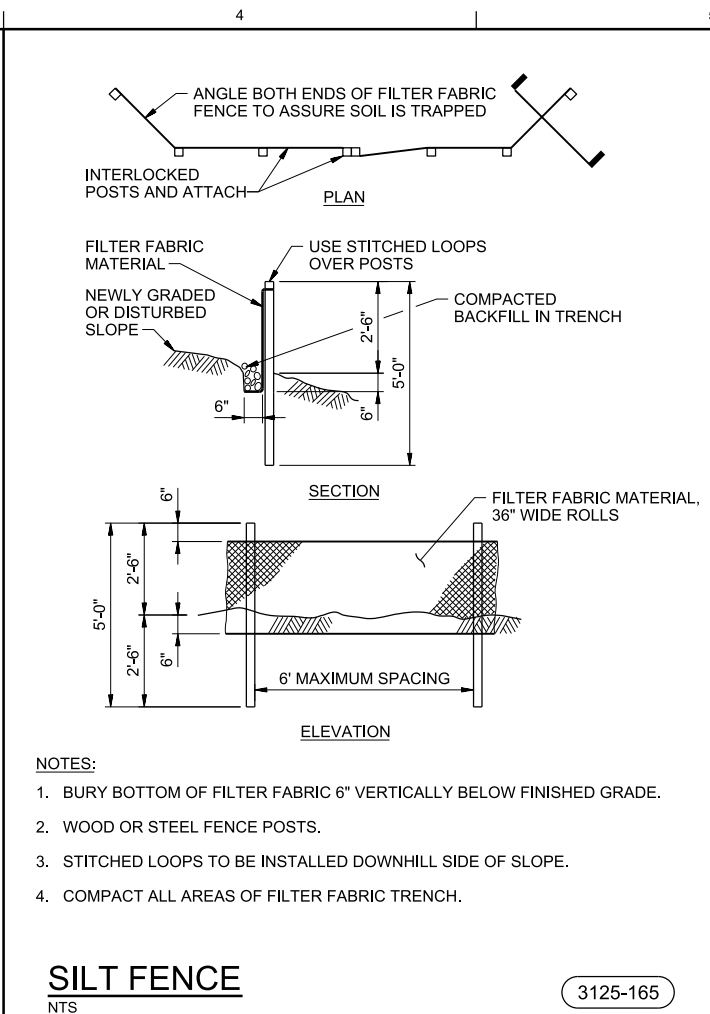
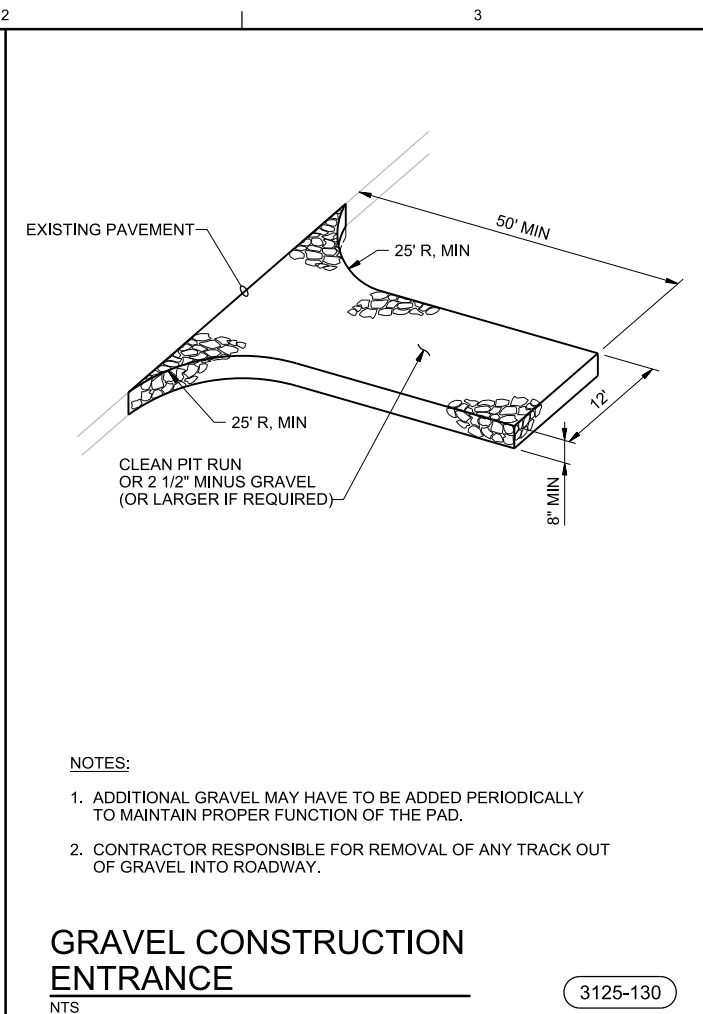
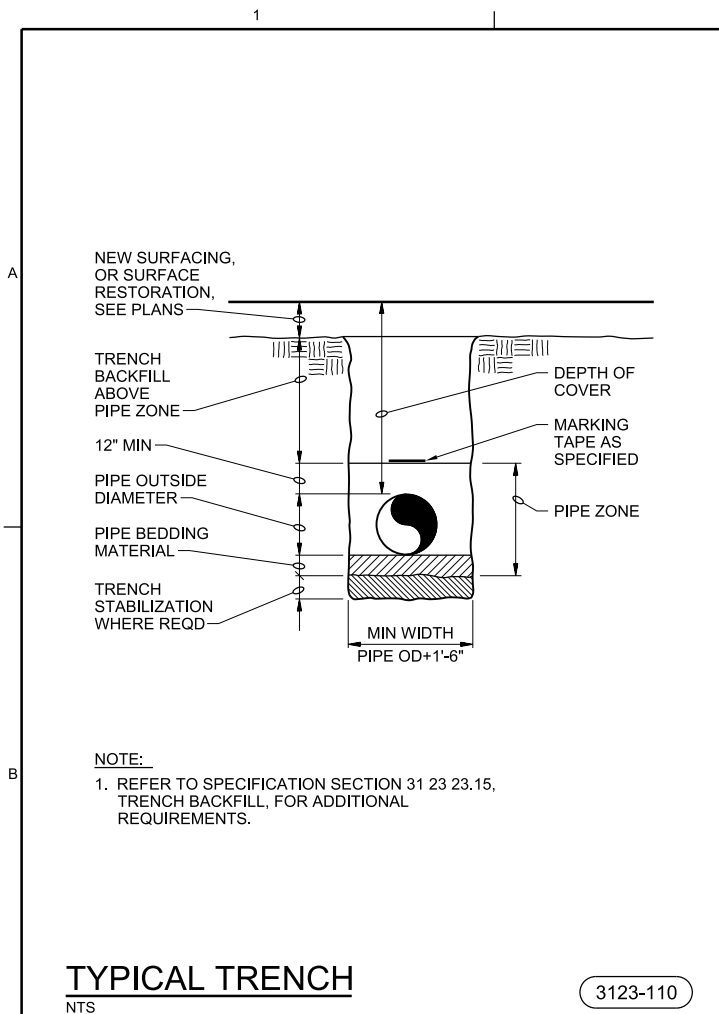
DGN

REVISION

APVD

BY

APVD



RESTRAINED JOINT TABLE

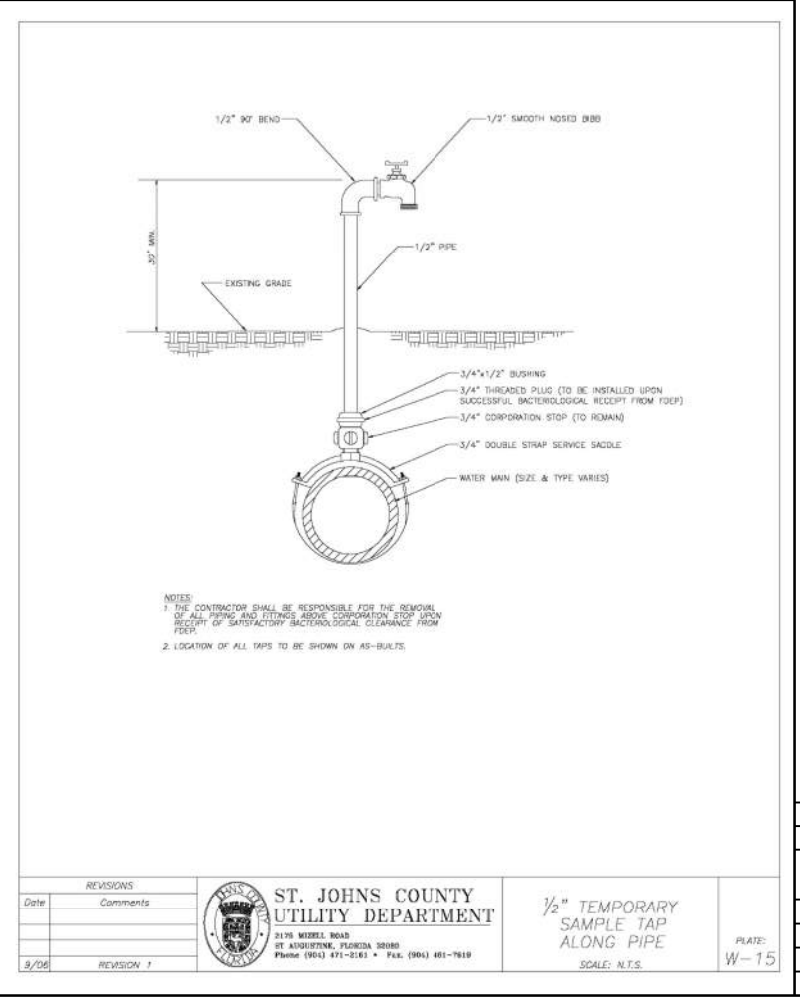
ST. JOHNS COUNTY UTILITY DEPARTMENT
2176 WHEEL ROAD
ST. AUGUSTINE, FLORIDA 32080
Phone (904) 471-2181 • Fax (904) 481-7818

NOMINAL PIPE SIZE (IN.)	BENDS (DEG.)				PLUGS/ VALVES	TEES * BRANCH SIZE (IN.)								
	11	22	45	90		4	6	8	10	12	14	16	18	20
4														
6														
8														
10														
12	5	9	17	42	178									
14														
16														
18														
20														

NOTES:
1. ENGINEER SHALL BE REQUIRED TO SUBMIT CALCULATIONS, SIGNED AND SEALED, TO DETERMINE LENGTHS BASED ON SIZE, TYPE AND SOIL CONDITIONS.
2. * 25' MINIMUM ON EACH RUN SIDE OF TEE.
3. 25' MINIMUM ON EACH SIDE OF REDUCER.

REVISIONS
Date: _____ Comments: _____
3/26 REVISION 1

PLATE: W-71
SCALE: N.T.S.



200 W FORSYTH STREET, SUITE 1520
JACKSONVILLE, FLORIDA 32202
E60000072 AA0001992
Richard Thomas Morrison FL PE 67713

NORTHWEST WELL NO. 7
WELL HEAD AND SITE
ST. JOHNS COUNTY UTILITY DEPARTMENT
ST. AUGUSTINE, FLORIDA

Jacobs
CIVIL
DETAILS

NTS
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE MAY 2021
PROJ EGXM1300
DWG C-90
SHEET 12 of 26

REVISIONS
NO. DATE DSGN DR CHK REVISION BY APVD
R MORRISON
B DYKES
R MORRISON

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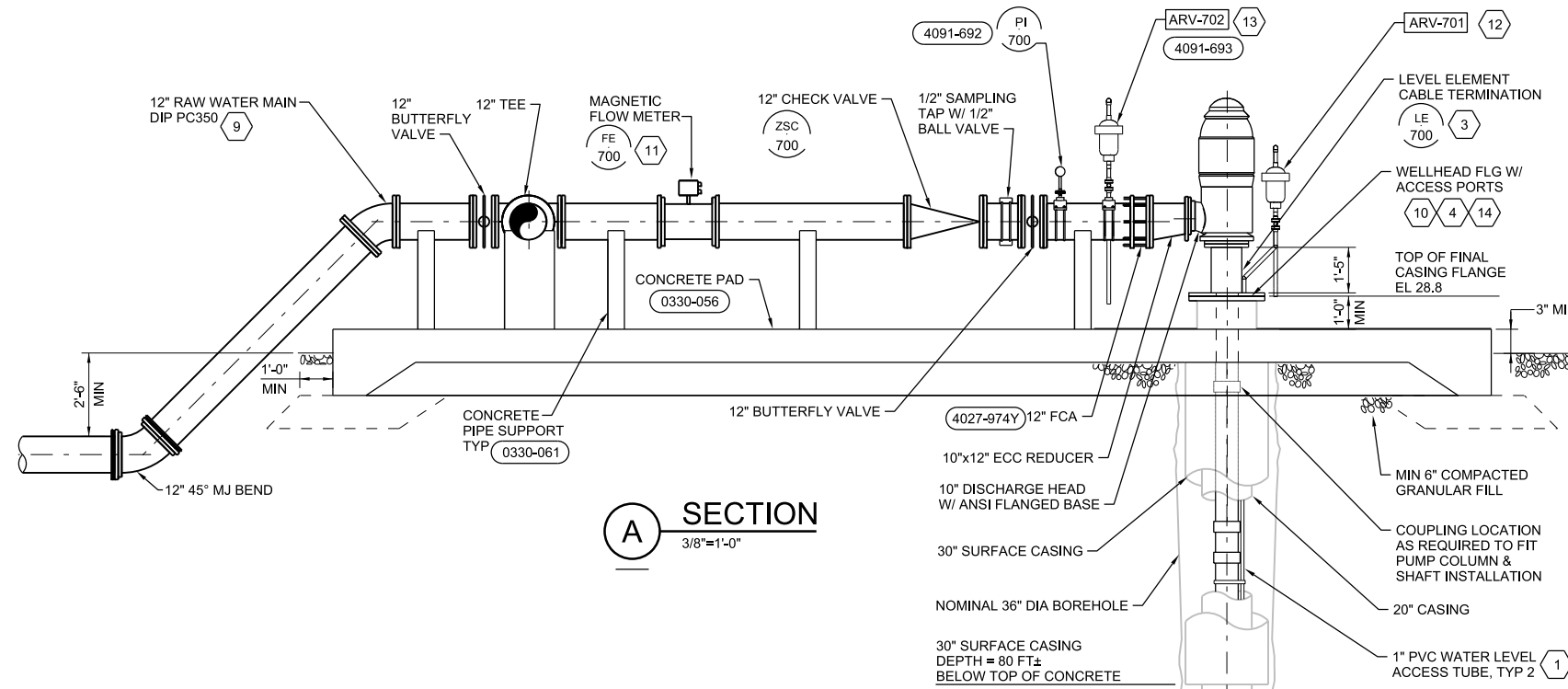
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GENERAL NOTES

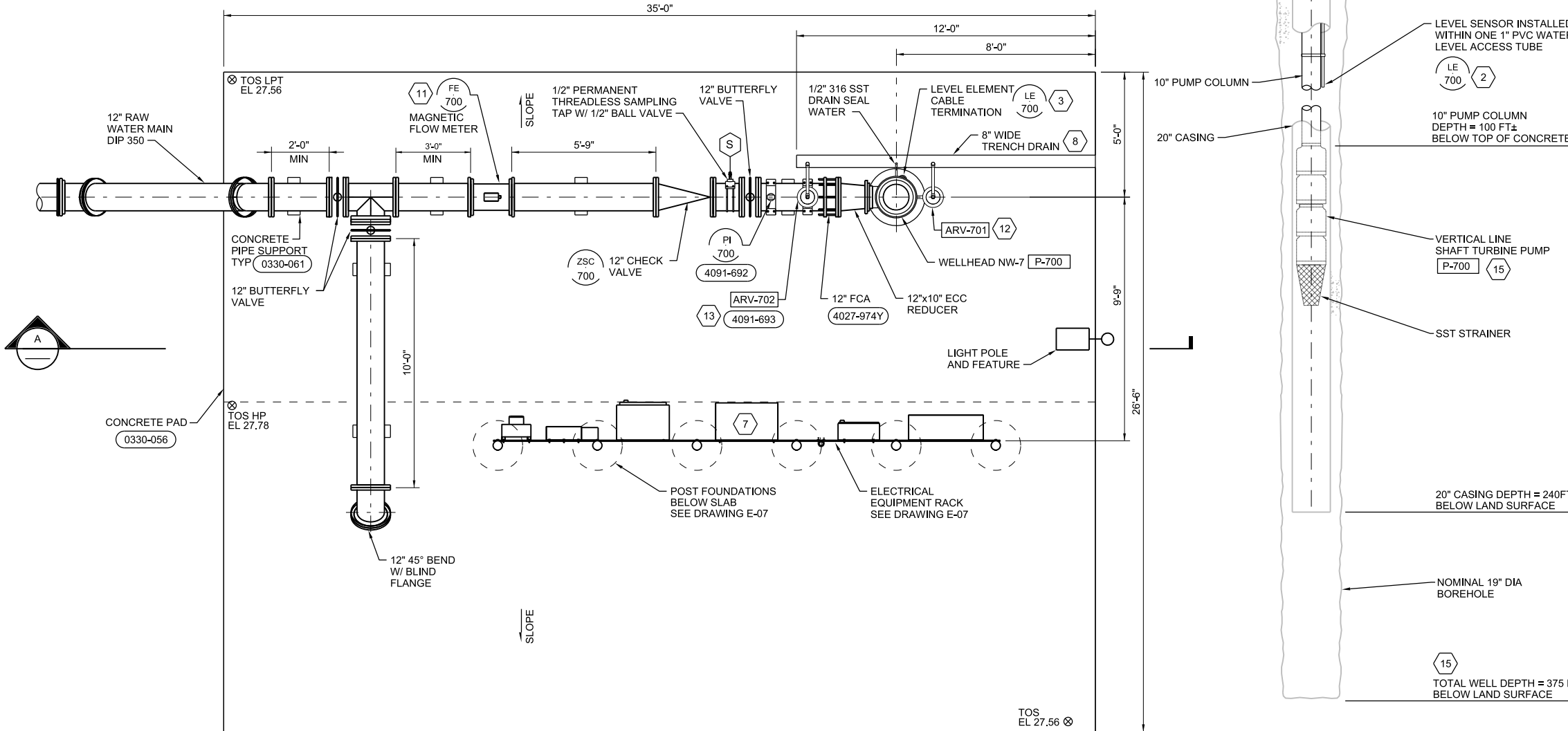
1. ITEM SHOWN SCREENED ARE EXISTING.

SHEET KEYNOTES

1. THREAD THE (2) 1-INCH PVC WATER LEVEL ACCESS TUBES INTO UNDERSIDE OF DISCHARGE HEAD. STRAP(SST) ACCESS TUBES TO PUMP COLUMN EVERY 10-FEET. TERMINATE ACCESS TUBES 5-FEET ABOVE THE PUMP BOWLS. CAP BOTTOM OF ACCESS TUBES. DRILL 1/4-INCH HOLES THROUGH ACCESS TUBES EVERY 3-FEET THROUGHOUT THE TUBE. DRILL 1/4-INCH HOLE THROUGH BOTTOM CAP.
2. MARK SENSOR CABLE WITH COLORED TAPE AT SPECIFIED DEPTH OF SUBMERGENCE.
3. INSTALL LEVEL SENSOR PER MANUFACTURER'S RECOMMENDATION, USING WATER TIGHT CABLE GLAND AT WELLHEAD. PROVIDE STRAIGHT MALE CORD CONNECTOR CONTA-CLIP CATALOG NUMBER 20901.
4. PROVIDE (1) 1-INCH STAINLESS THREADED ACCESS PORT FOR CASING VENT.
5. USE TYPE 316 SST BOLTS, NUT AND WASHERS ON ALL EXPOSED EQUIPMENT.
6. USE TYPE A307/A563 BOLTS, NUTS AND WASHERS ON ALL PIPING.
7. FASTEN PHENOLIC NAMEPLATE TO CONTROL PANEL THAT IS INSCRIBED WITH THE PROBE AND DROP PIPE DEPTHS.
8. CONC TRENCH SEE DETAIL B/C-90. COORDINATE TRENCH LENGTH AND POSITION TO ENSURE DRAINAGE FROM ARV DRAIN LINES.
9. COORDINATE FINAL CENTERLINE ELEVATION OF WELLHEAD PIPING WITH REQUIREMENTS OF PUMP DISCHARGE HEAD.
10. CONTRACTOR TO COORDINATE CONNECTION TO WELL CASING TOP FLANGE TO ASSURE BOLT HOLE ORIENTATION AND ALIGNMENT WITH THE WELL PUMP BASE.
11. SEE DRAWING E-06 FOR FLOW METER REQUIREMENTS.
12. 1"-V742 AIR/VACUUM VALVE, 1"-V307 BALL VALVE AND 1" SST PIPING INSTALLED ON ACCESS PORT. 1/2" SST DISCHARGE PIPING WITH SCREEN TO BE TERMINATED 12" ABOVE TRENCH DRAIN. CONTRACTOR TO SUPPORT ASSEMBLY AS NEEDED.
13. 2"-V742 AIR/VACUUM VALVE, 2"-V307 BALL VALVE AND 2" SST PIPING INSTALLED ON PIPE SADDLE. 1" SST DISCHARGE PIPING WITH SCREEN TO BE TERMINATED 12" ABOVE TRENCH DRAIN. CONTRACTOR TO SUPPORT ASSEMBLY AS NEEDED.
14. A. PUMP AND FINAL CASING FLANGE INSTALLATION SHALL BE PERFORMED BY A CERTIFIED WELL SUBCONTRACTOR. SUBCONTRACTOR SHALL REMOVE TEMPORARY CASING FLANGE AND INSTALL FINAL CASING FLANGE.
B. THE CONTRACTOR SHALL CONDUCT FIELD TESTS TO CONFIRM THE WELL CASING FLANGE IS LEVEL AND PLUMB AND MEETS THE REQUIREMENTS OF THE PUMP MANUFACTURER. THE PRECISION OF THE FIELD MEASUREMENTS TO DETERMINE THE WELL CASING FLANGE LEVEL SHALL BE AS RECOMMENDED BY THE PUMP MANUFACTURER.
1. IF THE WELL CASING FLANGE DOES NOT MEET THE PUMP MANUFACTURER'S REQUIREMENTS, PERFORM THE FOLLOWING:
A. NOTIFY THE ENGINEER AND OWNER IMMEDIATELY.
B. SUBMIT MODIFICATIONS TO THE WELLHEAD FLANGE AND ACCESS PORT ARRANGEMENT ASSEMBLY TO ADJUST FOR THE WELL CASING FLANGE LEVEL TO PROVIDE A SUFFICIENTLY LEVEL BASE FOR THE PUMP DISCHARGE HEAD.
C. THE CONTRACTOR SHALL INSTALL THE PUMP IN ACCORDANCE WITH THE MANUFACTURER'S FIELD SERVICES TECHNICIAN'S INSTRUCTIONS. THE MANUFACTURER'S FIELD SERVICE TECHNICIAN SHALL BE PRESENT DURING THE ENTIRE TIME THE PUMP IS INSTALLATION.
2. IF THE WELL CASING FLANGE MEETS THE PUMP MANUFACTURER'S REQUIREMENTS, SUBMIT A CONFIRMING STATEMENT WITH THE PUMP SHOP DRAWING.
C. THE CONTRACTOR SHALL INSTALL THE PUMP IN ACCORDANCE WITH THE MANUFACTURER'S FIELD SERVICES TECHNICIAN'S INSTRUCTIONS. THE MANUFACTURER'S FIELD SERVICE TECHNICIAN SHALL BE PRESENT DURING THE ENTIRE TIME THE PUMP IS INSTALLATION.
15. WELL DISINFECTION
A. USE FOLLOWING PROPORTIONS OF HYPOCHLORITE TO WATER:
1. SODIUM HYPOCHLORITE (5.25 PERCENT CL):
1 GALLON PER 4.25 GALLONS WATER. DILUTE THE LIQUID WITH WATER TO OBTAIN A 1 PERCENT SOLUTION (10,000 PPM CHLORINE).
B. DISINFECTION PROCEDURES: IN ACCORDANCE WITH AWWA C654, UNLESS HEREIN MODIFIED.
1. USE CHLORINE SOLUTION OF A VOLUME AND STRENGTH SO THAT A CONCENTRATION OF AT LEAST 50 PPM OF FREE CHLORINE IS CONTAINED IN THE WELL.
2. CHLORINE SOLUTION SHALL BE PLACED INTO THE WELL AND THE WELL SURGED FOR AT LEAST 5 MINUTES. AFTER 4 HOURS, THE WELL SHALL BE PUMPED OR BAILED UNTIL THE CHLORINE CONCENTRATION IS LESS THAN 5 PPM.
3. PUMP BOWLS, COLUMN, AND AIR-LINE SHALL BE THOROUGHLY WASHED, FIRST WITH CLEAR WATER AND THEN WITH A 200 PPM FREE CHLORINE SOLUTION IMMEDIATELY BEFORE BEING PLACED INTO THE WELL.



SECTION A
3/8"=1'-0"



PLAN
3/8"=1'-0"

200 W FORSYTH STREET, SUITE 1520
JACKSONVILLE, FLORIDA 32202
E86000072
Lawrence Bradley Gunn PE FL 65967

NORTHWEST WELL NO. 7
WELLHEAD AND SITE
ST. JOHNS COUNTY UTILITY DEPARTMENT
ST. AUGUSTINE, FLORIDA

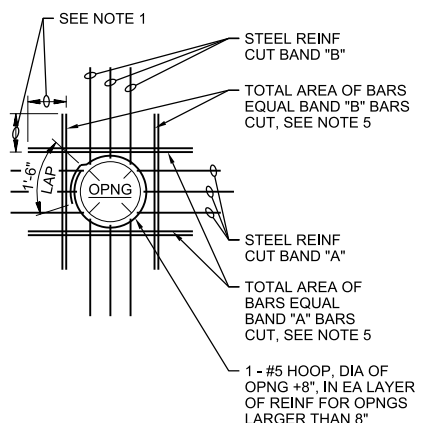
Jacobs
PROCESS MECHANICAL

**NORTHWEST WELL 7
WELLHEAD PLAN AND SECTION**

NO.	DATE	DR	CHK	BY	APVD

AS NOTED
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE: MAY 2021
PROJ: EGXM1300
DWG: M-01
SHEET: 13 of 26

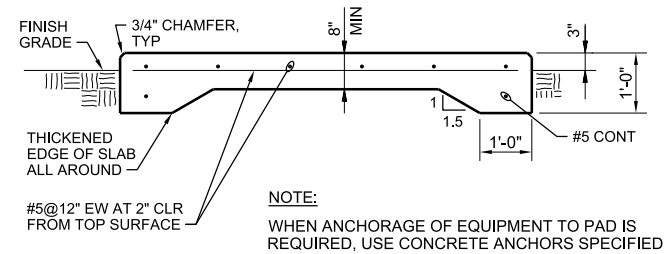
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- NOTES:**
1. PROVIDE MINIMUM LAP, SEE GENERAL STRUCTURAL NOTES.
 2. TYPICAL FOR ALL OPENINGS IN CONCRETE UNLESS INDICATED OTHERWISE ON PLANS.
 3. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS.
 4. PROVIDE A MINIMUM OF 2 "A" BARS AND 2 "B" BARS EACH SIDE OF OPENING (1 EACH FACE), INCLUDING DOWELS AND CORNER BARS, TYPICAL.
 5. SPACE AT 3 BAR DIAMETERS (OR 3" MINIMUM) ON CENTER. LOCATE HALF OF TOTAL AREA ON EACH SIDE OF OPENING.

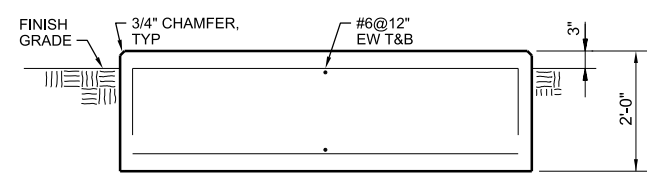
OPENING REINFORCEMENT
NTS

0330-001



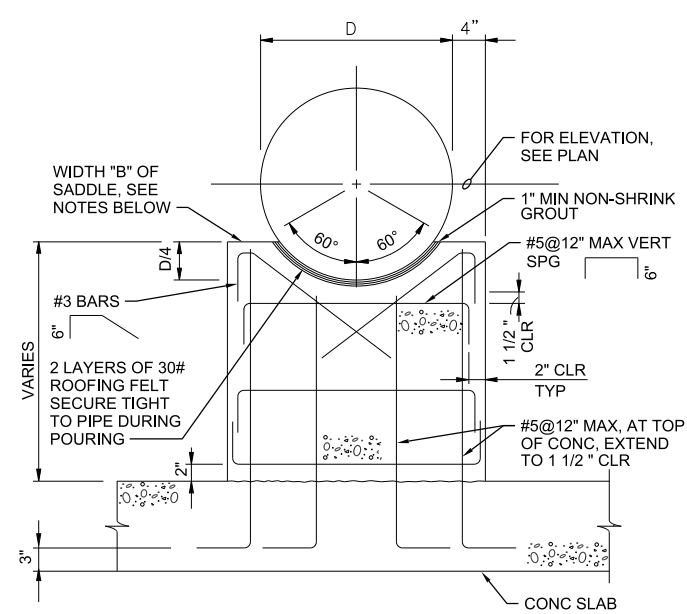
CONCRETE EQUIPMENT PAD
NTS

0330-056



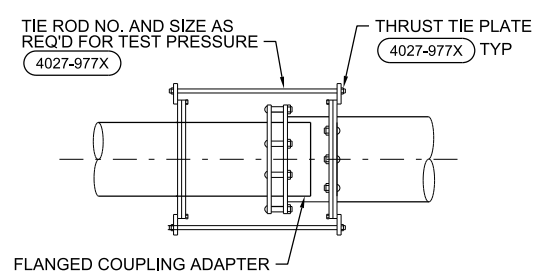
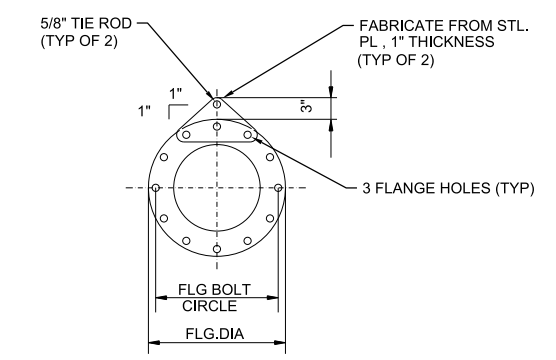
CONCRETE EQUIPMENT PAD
NTS

0330-057



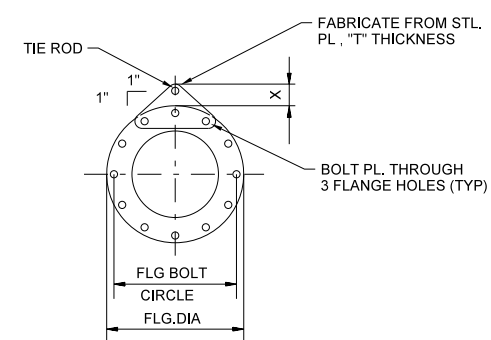
PIPE SUPPORT - CONCRETE SADDLE
NTS

0330-061



RESTRAINED FLANGED COUPLING ADAPTER
NTS

4027-974Y



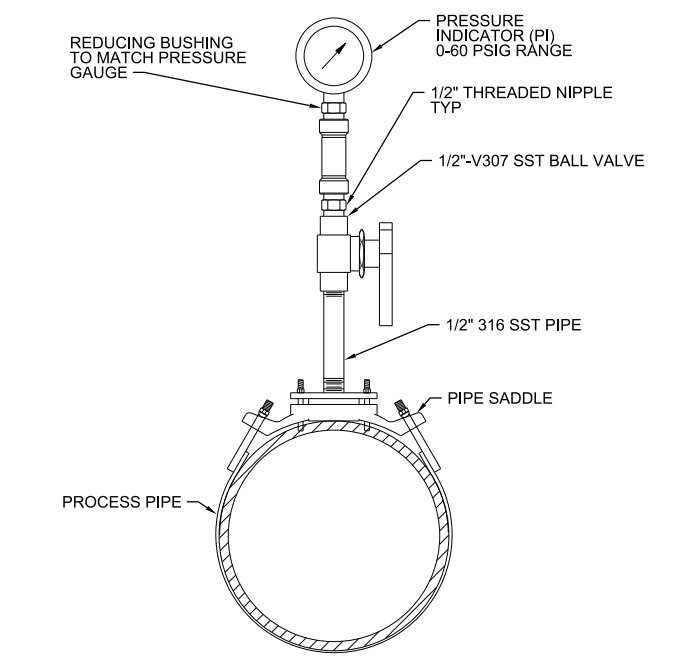
PIPE SIZE	X	T @ TEST	
		PRESS <150 PSI	150 < PRESS <375 PSI
6"	2 3/4"	5/8"	5/8"
8"	2 3/4"	5/8"	3/4"
10"	2 3/4"	5/8"	1"
12"	3"	3/4"	1"
14"	3 1/4"	3/4"	1"
16"	3 1/4"	1"	1"
18"	3 1/2"	1"	1"
20"	3 3/4"	1"	1 1/2"
22"	4"	1"	1 3/4"
24"	4 1/4"	1 1/4"	1 3/4"
30"	4 1/4"	1 1/4"	1 3/4"
36"	4 1/2"	1 1/2"	1 3/4"
42"	4 3/4"	1 1/2"	1 7/8"
48"	4 3/4"	1 1/2"	1 7/8"
54"	4 3/4"	1 1/2"	1 7/8"
60"	4 3/4"	1 1/2"	1 7/8"

THRUST TIE ROD/ CONNECTION PLATE
NTS

4027-977X

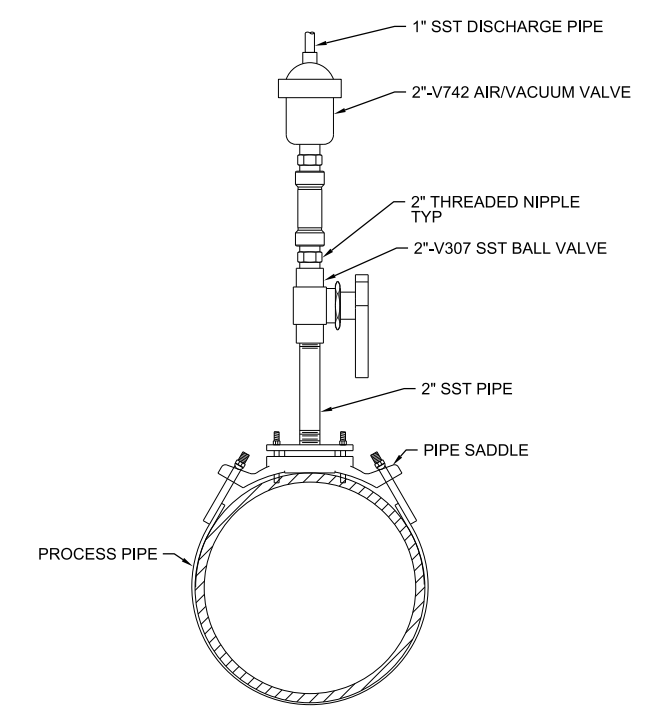
TEST PRESSURE	PIPE DIA. (IN.)	MINIMUM PIPE WALL THICKNESS (IN.)	TIE ROD SCHEDULE											
			25 PSI		50 PSI		100 PSI		150 PSI		225 PSI		375 PSI	
			DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D	DIA. (IN.)	NO. REQ'D
6	3/16	-	-	5/8	2	5/8	2	5/8	2	5/8	2	5/8	2	
8	3/16	-	-	5/8	2	5/8	2	5/8	2	5/8	2	3/4	2	
10	3/16	-	-	5/8	2	5/8	2	5/8	2	5/8	2	7/8	2	
12	3/16	5/8	2	5/8	2	5/8	2	5/8	2	5/8	2	7/8	4	
14	3/16	5/8	2	5/8	2	3/4	2	3/4	2	3/4	4	1	4	
16	3/16	5/8	2	5/8	2	3/4	2	7/8	2	7/8	4	1	4	
18	1/4	5/8	2	5/8	2	7/8	2	1	2	1	4	1-1/4	4	
20	1/4	5/8	2	3/4	2	7/8	2	7/8	4	7/8	4	1-1/4	4	
22	1/4	5/8	2	3/4	2	3/4	4	7/8	4	7/8	4	1-1/2	4	
24	1/4	5/8	2	3/4	2	7/8	4	1	4	1	6	1-1/2	6	
30	1/4	5/8	4	3/4	4	7/8	6	1	6	1	8	1-1/2	8	
36	1/4	3/4	4	7/8	4	1	6	1	8	1	8	1-1/2	10	
42	1/4	3/4	4	1	4	1	8	1-1/4	8	1-1/4	8	1-3/4	10	
48	5/16	7/8	4	7/8	8	1	10	1-1/4	10	1-1/4	10	1-3/4	12	
54	5/16	3/4	6	7/8	8	1	12	1-1/4	12	1-1/4	12	1-3/4	14	
60	11/32	7/8	6	1	8	1-1/4	10	1-1/4	14	1-1/4	14	1-3/4	16	

- NOTES:**
1. TIE RODS SHALL CONFORM TO ASTM A193 GRADE B7.
 2. NUTS SHALL CONFORM TO ASTM A194 GRADE 2H.
 3. PLATE SHALL CONFORM TO ASTM A283 GRADE D.
 4. TIE ROD NUTS SHALL BE TIGHTENED GRADUALLY AND EQUALLY IN STAGES TO PREVENT UNEVEN ALIGNMENT AND TO ALLOW EQUAL STRESS ON ALL TIE RODS UNDER PRESSURE. TIGHTEN UNTIL SNUG. THREADS SHALL PROTRUDE FROM NUTS. PEEN THREADS AFTER TIGHTENING NUTS.
 5. CONTRACTOR SHALL USE DATA FOR ONLY THOSE PIPE SIZES AND TEST PRESSURES SPECIFIED IN THIS CONTRACT.



PRESSURE CONNECTION INSTALLATION DETAIL
NTS

4091-692



2" WELLHEAD AIR/VACUUM VALVE DETAIL
NTS

4091-693

200 W FORSYTH STREET, SUITE 1520
JACKSONVILLE, FLORIDA 32202
E60000072
Lawrence Bradley Gunn PE FL 65967

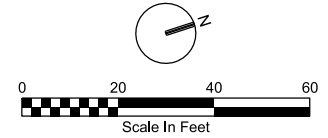
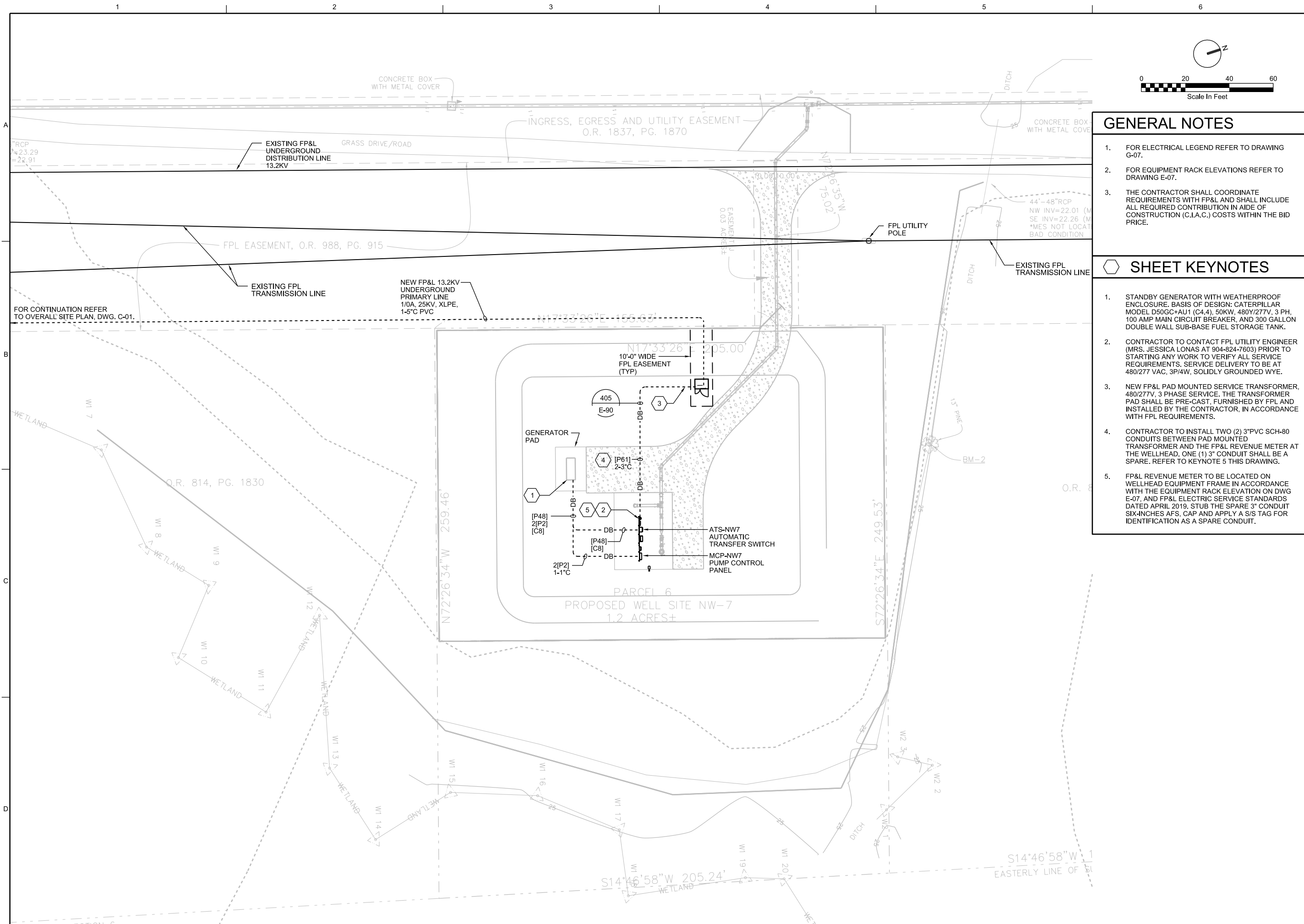
NORTHWEST WELL NO. 7
WELLHEAD AND SITE
ST. JOHNS COUNTY UTILITY DEPARTMENT
ST. AUGUSTINE, FLORIDA

PROCESS MECHANICAL AND STRUCTURAL
DETAILS

NTS
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE MAY 2021
PROJ EGXM1300
DWG M-90
SHEET 14 of 26

REVISION
NO. DATE
DR L GUNN
CHK N PATTERSON
REVISED I TRULLENQUE
BY APVD L GUNN

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GENERAL NOTES

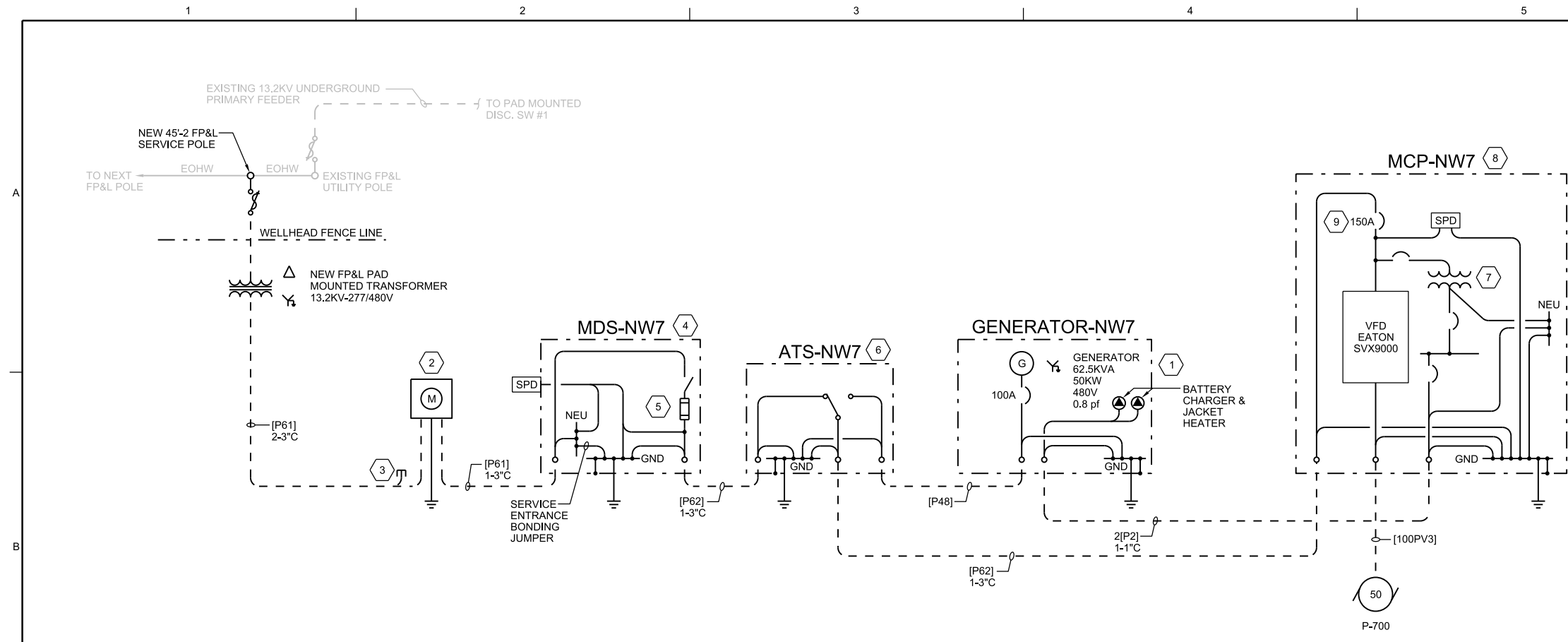
- FOR ELECTRICAL LEGEND REFER TO DRAWING G-07.
- FOR EQUIPMENT RACK ELEVATIONS REFER TO DRAWING E-07.
- THE CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH FP&L AND SHALL INCLUDE ALL REQUIRED CONTRIBUTION IN AIDE OF CONSTRUCTION (C.I.A.C.) COSTS WITHIN THE BID PRICE.

SHEET KEYNOTES

- STANDBY GENERATOR WITH WEATHERPROOF ENCLOSURE. BASIS OF DESIGN: CATERPILLAR MODEL D50GC-AU1 (C4.4), 50KW, 480Y/277V, 3 PH, 100 AMP MAIN CIRCUIT BREAKER, AND 300 GALLON DOUBLE WALL SUB-BASE FUEL STORAGE TANK.
- CONTRACTOR TO CONTACT FPL UTILITY ENGINEER (MRS. JESSICA LONAS AT 904-824-7603) PRIOR TO STARTING ANY WORK TO VERIFY ALL SERVICE REQUIREMENTS. SERVICE DELIVERY TO BE AT 480/277 VAC, 3P/4W, SOLIDLY GROUNDED WYE.
- NEW FP&L PAD MOUNTED SERVICE TRANSFORMER, 480/277V, 3 PHASE SERVICE. THE TRANSFORMER PAD SHALL BE PRE-CAST, FURNISHED BY FPL AND INSTALLED BY THE CONTRACTOR, IN ACCORDANCE WITH FPL REQUIREMENTS.
- CONTRACTOR TO INSTALL TWO (2) 3\"/>

200 W FORSYTH STREET, SUITE 1520 JACKSONVILLE, FLORIDA 32202 E6000072 AA001992 AGUSTIN C. QUINONES PE FL 68295		NORTHWEST WELL NO. 7 WELLHEAD AND SITE ST. JOHNS COUNTY UTILITY DEPARTMENT ST. AUGUSTINE, FLORIDA	
		ELECTRICAL SITE PLAN	
DATE	MAY 2021	PROJ	EGXM1300
DWG	E-01	SHEET	15 of 26

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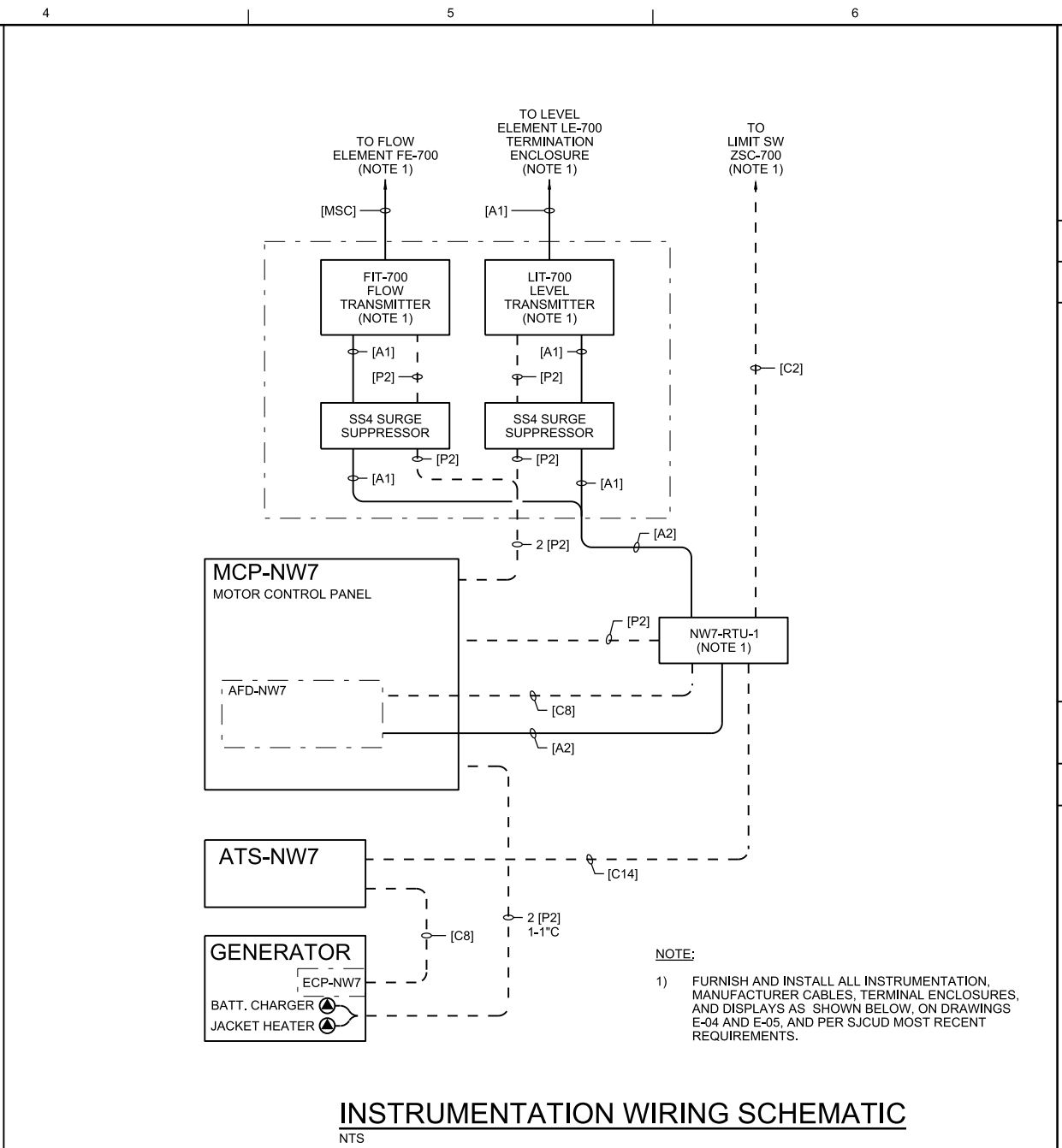
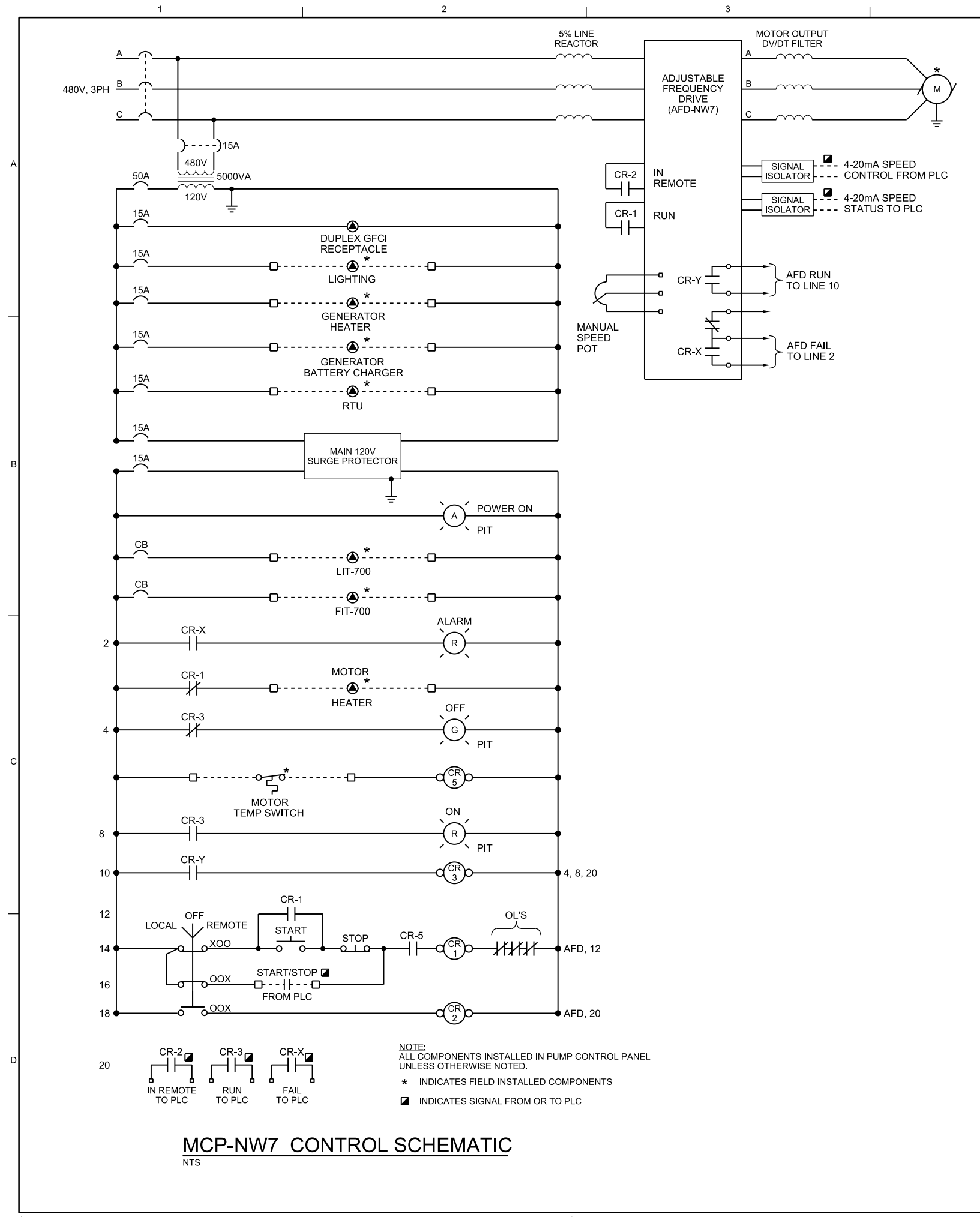
SINGLE LINE DIAGRAM

- ### SHEET KEYNOTES
- STANDBY GENERATOR AND AUTOMATIC TRANSFER SWITCH TO BE FURNISHED BY SJUD AND INSTALLED BY THE CONTRACTOR. BASIS OF DESIGN: CATERPILLAR MODEL D50GC+AU1 (C4.4), 50KW, 480Y/277V, 3Ø WITH 100 AMP GENERATOR MAIN CIRCUIT BREAKER, WEATHERPROOF ENCLOSURE, AND 300 GALLON DOUBLE WALL SUB-BASE TANK, CONNECT GENERATOR GROUND AND NEUTRAL BUS INTERNALLY TO FORM A SEPARATELY-DERIVED (BONDED NEUTRAL) SYSTEM. THE STANDBY GENERATOR SHALL BE SPECIFICALLY RATED AND CONFIGURED BY THE MANUFACTURER FOR THE HIGH PERCENTAGE OF NON-LINEAR VFD LOADING, INCLUDING OVERSIZE ALTERNATOR AND COOLING SYSTEM.
 - FURNISH AND INSTALL METERING SOCKET, CONDUIT AND WIRING PER FP&L SERVICE REQUIREMENTS AND STANDARDS. COORDINATE WITH FP&L FOR PHYSICAL LOCATION AND DETAILS. REFER TO DWG E-01 FOR ADDITIONAL DETAILS. CONTRACTOR SHALL COORDINATE WITH FP&L ALL ASPECTS ASSOCIATED WITH THE ELECTRIC SERVICE DELIVERY, FINAL INSPECTION AND ESTABLISHING SERVICE TO THE WELLHEAD.
 - STUB SPARE 3" CONDUIT 6-INCHES AFS BENEATH METER AND CAP FOR FUTURE USE.
 - SERVICE ENTRANCE RATED MAIN FUSIBLE DISCONNECT SWITCH, HEAVY DUTY TYPE, 200A, 480VAC, NEMA 4X 316 STAINLESS STEEL ENCLOSURE, WITH TRS200R FUSES.
 - FURNISH AND INSTALL SIGNAGE INDICATING THE 200AMP MAIN FUSIBLE DISCONNECT SWITCH (MDS) AS THE SERVICE DISCONNECT. SIGNAGE SHALL BE 6" BY 4" IN SIZE, RED LAMINATE, ETCHED TO A WHITE CORE, LETTERING APPROPRIATELY SIZED FOR THE SIGNAGE, AND ATTACHED TO THE FRONT EXTERIOR OF THE (MDS) WITH S/S HARDWARE.
 - AUTOMATIC TRANSFER SWITCH, ASCO 7000 SERIES, 200A, 3P/3W, 480V, SHORT TIME RATED, NEMA 4X S/S ENCLOSURE, BOTTOM LOAD CONNECTIONS, SWITCH POSITION AND SOURCE AVAILABLE DRY CONTACTS.
 - REFER TO VFD CONTROL WIRING SCHEMATIC ON DWG E-06.
 - REFER TO PUMP CONTROL PANEL DETAILS AT DWG E-08 AND MOTOR CONTROL SCHEMATIC AT DWG E-06.
 - MAIN BREAKER OF PUMP CONTROL PANEL SHALL BE 150A/HMCP SQUARE D MODEL NO. HJL36150M74.

CIRCUIT CALLOUTS	
[P2]	[3/4" C, 2#12, 1#12G]
[P48]	[1 1/2" C, 3#3, 1#8G]
[P61]	[3" C, 3#3/0, 1#4 NEU], [3" C, SPARE]
[P62]	[3" C, 3#3/0, 1#4 GND]
[100PV3]	[2 1/2" C, 1(3C #2, 1#2G) TYPE 8], [2#12, 2#14, 1#12G]
[C2]	[1" C, 2#14, 1#14G]
[C8]	[1" C, 8#14, 1#14G]
[C14]	[1" C, 14#14, 1#14G]
[A1]	[1" C, 1 TYPE 3]
[A2]	[1" C, 2 TYPE 3]
[MSC]	[1" C, MANUFACTURER SUPPLIED CABLE]

ELECTRICAL LOAD CALCULATIONS NORTHWEST WELL NO. 7		
WELL PUMP NW7-P-1	50 HP	65 AMPS
TOTAL MOTOR LOAD		65 AMPS
LIGHTING AND CONTROLS	5 KVA	11 AMPS
TOTAL CONNECTED LOAD		76 AMPS
TOTAL NON-COINCIDENTIAL LOADS		0 AMPS
PEAK DEMAND AMPS		76 AMPS
PEAK DEMAND KVA		63.2 KVA
0.25 X LARGEST MOTOR		16.3 AMPS
MIN SERVICE AMPACITY		92.3 AMPS
ELECTRIC SERVICE:		
200 AMP, 480/277 VOLTS, 3 PHASE, WYE		

200 W FORSYTH STREET, SUITE 1520 JACKSONVILLE, FLORIDA 32202 E6000072 AA001992 AGUSTIN C. QUINONES PE FL 68295		NORTHWEST WELL NO. 7 WELLHEAD AND SITE ST. JOHNS COUNTY UTILITY DEPARTMENT ST. AUGUSTINE, FLORIDA	
		<p style="text-align: center;">ELECTRICAL SINGLE LINE DIAGRAM</p>	
DATE	MAY 2021	NO.	DATE
PROJ	EGXM1300	DR	DATE
DWG	E-05	CHK	DATE
SHEET	19 of 26	APVD	DATE
A QUINONES		A QUINONES	
M GOSLOW		M GOSLOW	
C HAMER		C HAMER	



INSTRUMENT PROBES/TRANSMITTERS
BASIS OF DESIGN:

FLOW:
SIEMENS SITRANS FLOWMETER MAG 5100 W (FE-700), FULL BORE
SIEMENS SITRANS MAG 6000, 7ME6920-2EA10-1AA0 (FIT-700) REMOTE MOUNT

INCLUDE:
- 1/2" NB
- EPDM LINER
- HASTELLOY ELECTRODES
- (2) POTENTIAL EQUALIZING RINGS
- CLASS 1 CALIBRATION
- 60 FT MSC CABLE

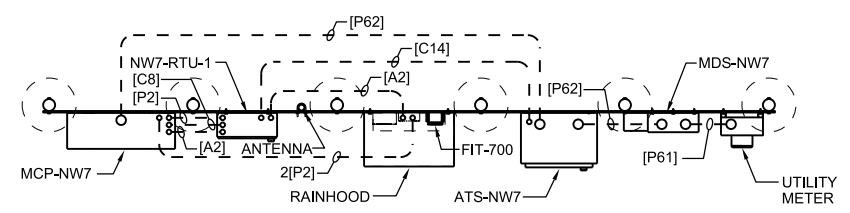
LEVEL:
SUBMERSIBLE TRANSMITTER: BLUE RIBBON BR313S-NI (LE-700), 0.1%: 30 PSIG; LOCATED 69.3- FEET FROM TOP OF CASING.
TERMINATION ENCLOSURE: PMC TE-11-AC W/ MP-11
ENDRESS AND HAUSER PROCESS DISPLAY: RIA46-1530/0-A, A1, B, B1 (LIT-700)

NOTES:
CONTRACTOR TO CONFIRM ALL DEVICES WITH OWNER PRIOR TO PURCHASE.
SEE MECHANICAL DRAWINGS AND SPECIFICATION SECTIONS 40 90 01 AND 40 90 11 FOR ADDITIONAL DETAIL.

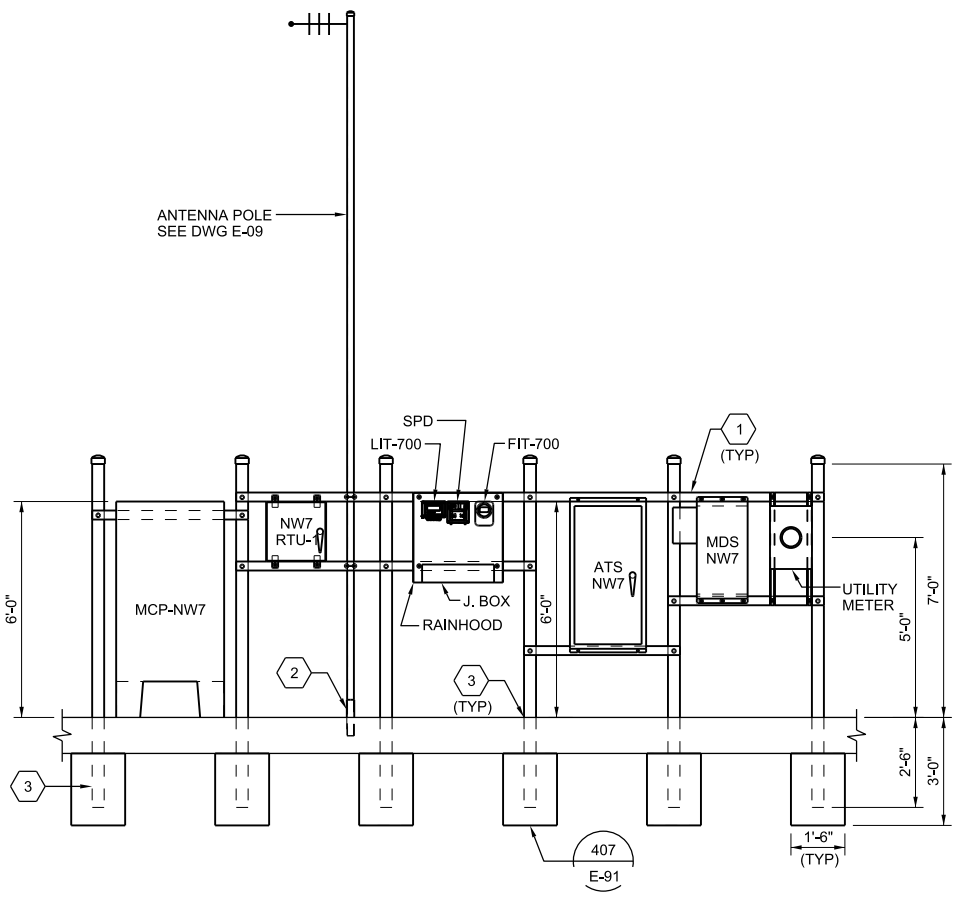
200 W FORSYTH STREET, SUITE 1520 JACKSONVILLE, FLORIDA 32202 E6000072 AA001992 AGUSTIN C. QUINONES PE FL 88295		NORTHWEST WELL NO. 7 WELLHEAD AND SITE ST. JOHNS COUNTY UTILITY DEPARTMENT ST. AUGUSTINE, FLORIDA	
NO.	DATE	DR	CHK
REVISION	BY	APVD	BY
A QUINONES		A QUINONES	
C HAMER		M GOSLOW	
A QUINONES		A QUINONES	
Jacobs ELECTRICAL			
MOTOR CONTROL SCHEMATIC AND INSTRUMENTATION RISER DIAGRAM			
AS NOTED			
VERIFY SCALE			
BAR IS ONE INCH ON ORIGINAL DRAWING.			
DATE	MAY 2021		
PROJ	EGXM1300		
DWG	E-06		
SHEET	20 of 26		

SHEET KEYNOTES

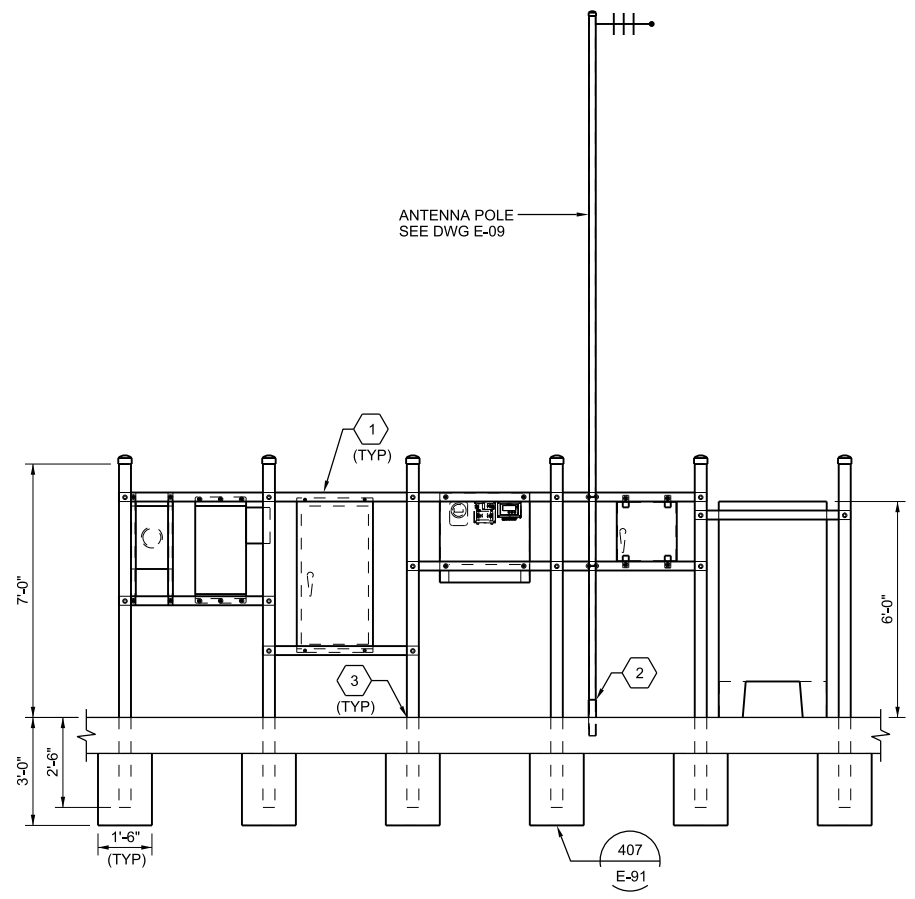
- FURNISH AND INSTALL 1/2" X 3" ALUMINUM SUPPORT BARS AS REQUIRED TO PROPERLY SUPPORT RACK MOUNTED EQUIPMENT. TOP AND BOTTOM ELEVATION VIEWS FOR EXAMPLE ONLY. VERTICAL STRUT NOT PERMITTED.
- SLEEVE CONCRETE SLAB TO ALLOW FOR ANTENNA POLE ROTATION.
- BITUMASTIC SEAL, TYPICAL FOR ALL ALUMINUM POSTS AS SHOWN IN DETAIL 407 ON DWG E-91.



PLAN VIEW



NORTH ELEVATION



SOUTH ELEVATION

EQUIPMENT RACK DETAILS

3/8"=1"

200 W FORSYTH STREET, SUITE 1520
 JACKSONVILLE, FLORIDA 32202
 EA0000072
 AGUSTIN C. QUINONES PE FL 88295

Jacobs
 ELECTRICAL
EQUIPMENT RACK DETAILS

NORTHWEST WELL NO. 7
 WELLHEAD AND SITE
 ST. JOHNS COUNTY UTILITY DEPARTMENT
 ST. AUGUSTINE, FLORIDA

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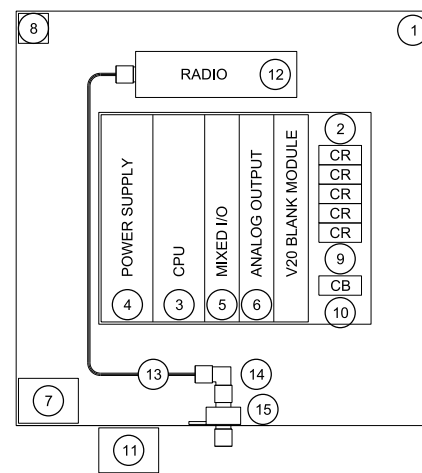
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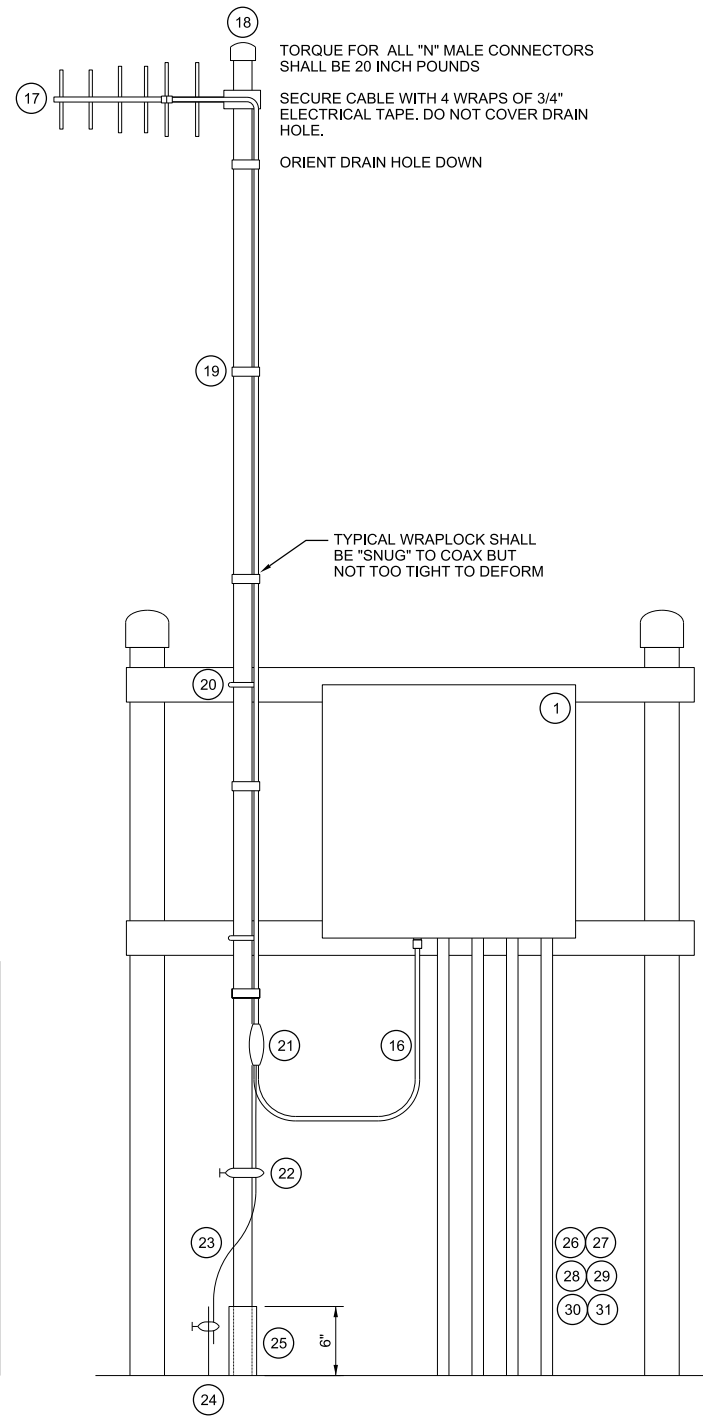
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SCADA SYSTEM NOTES:

- THE CONTRACTOR SHALL EMPLOY THE SERVICES OF A SJCUD PRE-APPROVED SCADA SYSTEM INTEGRATOR TO PERFORM ALL SCADA SYSTEM ADDITIONS AND MODIFICATIONS INCLUDING: NEW RTU, ANTENNA, AND MAST.
- THE SCADA SYSTEM SUPPLIER SHALL MODIFY AND UPGRADE THE EXISTING SJCUD MASTER SCADA SYSTEM AS REQUIRED TO INCORPORATE THE NEW FACILITIES.
- THE CONTRACTOR AND THE SCADA SYSTEM SUPPLIER SHALL COORDINATE ALL SCADA SYSTEM INSTALLATION WITH THE SJCUD SCADA SYSTEM SUPERVISOR.
- THE SCADA SYSTEM RTU SHALL BE A SJCUD STANDARD WELLHEAD RTU WITH MOTOROLA ACE3600 RTU CONFIGURED WITH MIXED I/O MODULES AS INDICATED. PROVIDE POWER AND SIGNAL LINE SURGE PROTECTION.
- PRIOR TO SHOP DRAWING SUBMITTALS, THE SCADA SYSTEM SUPPLIER SHALL CONFIRM RADIO/ANTENNA SELECTION WITH THE SJCUD SCADA SYSTEM SUPERVISOR.
- IN ORDER TO MAINTAIN FCC PART 15 COMPLIANCE, ALL ANTENNA WORK MUST BE PERFORMED OR CERTIFIED BY AN FCC CERTIFIED TECHNICIAN. THE SJCUD SCADA SUPERVISOR WILL INSPECT AND CERTIFY (AT NO CHARGE) BUT WILL NOT PERFORM CORRECTIVE ACTIONS.
- ANTENNA MAST GROUND ROD SHALL BE BONDED (UNDERGROUND) TO THE STATION ELECTRICAL SYSTEM GROUNDING ELECTRODE SYSTEM.
- ALL LIGHTNING PROTECTION GROUNDING CONDUCTORS SHALL HAVE AN EVEN SLOPE FROM POINT OF CONTACT TO THE GROUND ROD (NO 90° BENDS).
- ALL GROUND CONTACT POINTS SHALL BE PROTECTED BY AN ANTI-OXIDATION COMPOUND.
- ALL RF CONNECTORS SHALL BE TIGHTENED TO MANUFACTURER SPECIFICATIONS AND SHALL BE PROPERLY SEALED. COLD SHRINK IS NOT ACCEPTABLE.
- DRAIN HOLES ON ANTENNAS MUST BE ORIENTED DOWN.
- ALL THREADED CONNECTIONS, EXCEPT ANTENNA CONNECTIONS, SHALL BE PROTECTED WITH ANTI-SEIZE TREATMENT.
- PROVIDE DIN RAIL ON BACK PLANE AT THE RTU RADIO MOUNTING LOCATION FOR THE 4RF RADIO MOUNTING BRACKET. MOUNT THE DIN RAIL USING EXISTING TAPPED SCREW HOLES. DO NOT DRILL AND TAP NEW HOLES.



SCADA SYSTEM RTU DETAIL
NTS



SCADA SYSTEM ANTENNA DETAIL
NTS

SCADA SYSTEM EQUIPMENT SCHEDULE	
ITEM	DESCRIPTION
1	RTU ENCLOSURE, SCHAEFER'S ELECTRICAL ENCLOSURE MODEL SPN4AL-20208-735, DO NOT SUBSTITUTE, NEMA 12/3R ALUMINUM ENCLOSURE, PADLOCK PROVISIONS, ALUMINUM TOP, SIDES, AND DOOR SUN SHIELDS
2	MOTOROLA ACE3600 METAL CHASSIS WITH 3 I/O SLOT FRAME V214/V103
3	MOTOROLA ACE3600 RTU WITH UPGRADE TO CPU3680 AND SECURITY ENABLE OPTION F7509/V448/VA00360AA
4	MOTOROLA CPU PLUG-IN ETHERNET 10/100 M PORT V212
5	MOTOROLA ACE3600 AC POWER SUPPLY WITH BATTERY CHARGER V261
6	MOTOROLA ACE3600 MIXED I/O MODULE, 16DI, 4 EE DO, 4AI ±20mA WITH FLOATING POWER SUPPLY
7	MOTOROLA ACE3600 4 CHANNEL 4-20mA ANALOG OUTPUT MODULE V118
8	MOTOROLA BATTERY POWER CABLE FKN8376
9	BATTERY BACKUP 12V, 7AH, SEALED RECHARGEABLE SLA BATTERY, TOYO-USP 6FMS7
10	INTRUSION SWITCH WITH PULL TO DEFEAT FEATURE HONEYWEL MICRO SWITCH 1DM401
11	DIN RAIL MOUNTED DIGITAL OUTPUT CONTROL RELAYS OMRON G2R-1-SNI-DC12-S, 12VDC, SPDT, PTT
12	DIN RAIL MOUNTED CIRCUIT BREAKER SUPPLEMENTARY PROTECTOR EATON FAZ-C10/1-S-P
13	DITEK DTK-120HW SURGE PROTECTION DEVICE 120VAC
14	4RF DIGITAL RADIO MODEL APSQ-N220-SSC-HD-22-ENAA
15	4RF DIGITAL RADIO DIN RAIL MOUNTING BRACKET APSB-MBRK-DIN (NOTE 15)
16	RADIO POWER CABLE 12VDC WITH PLUG COMPATIBLE WITH MOTOROLA POWER SUPPLY
17	RADIO COMMUNICATION CABLE TYPE 568B ETHERNET CABLE, 1M
18	LMR-195 FLEXIBLE COAX, N MALE/TNC MALE CONNECTORS, 35" LONG
19	L-COM AXA-NMNM90 TYPE N MALE/MALE RIGHT ANGLE ADAPTER
20	TIMES MICROWAVE LP-HBX-NFF COAX SURGE ARRESTER
21	TIMES MICROWAVE LMR-600-DB COAX, TYPE N MALE CONNECTORS EZ-400-NM-H
22	SCALA MODEL TY-900 ANTENNA
23	ANTENNA MAST 2" X 20' LONG SCHEDULE 40 ALUMINUM PIPE, WITH PVC CAP
24	1/2" SS WRAPLOCK BANDS, 3' ON CENTER, TIE WRAPS ARE NOT ACCEPTABLE
25	3/8" SS U-BOLTS, ANTI SEIZE MUST BE USED ON ALL THREADS
26	TESSCO GK-S38 COAX GROUND KIT
27	GROUNDING CLAMP RATED FOR DIRECT BURIAL
28	NO. 4 AWG SOLID TINNED COPPER CONDUCTOR
29	COPPER CLAD STEEL GROUND ROD, 5/8" DIAMETER, 10' LONG
30	2.5" SCHEDULE 40 GRAY PVC CONDUIT SLEEVE THROUGH SLAB
31	1" SCH 80 PVC "POWER" CONDUIT TO PUMP CONTROL PANEL, 120 VDC CONDUCTORS
32	1" SCH 80 PVC "CONTROL" CONDUIT TO PUMP CONTROL PANEL, 24 VDC CONDUCTORS
33	1" SCH 80 PVC "CONTROL" CONDUIT TO ATS, 24 VDC CONDUCTORS
34	1" SCH-80 PVC "ANALOG CONTROL" CONDUIT TO AFD, TYPE 3 CONDUCTORS
35	1" SCH-80 PVC "ANALOG INPUT" CONDUIT FROM LIT/FIT-700, TYPE 3 CONDUCTORS
36	1" CH-80 PVC "DISCRETE INPUT" CONDUIT FROM ZSC-700, 24VDC CONDUCTORS

RTU I/O SCHEDULE			
MIXED I/O MODULE		ANALOG OUTPUT MODULE	
DI	SIGNAL DESCRIPTION	AO	SIGNAL DESCRIPTION
01	RTU INTRUSION SWITCH	01	WELL VFD SPEED COMMAND
02	GENERATOR RUNNING	02	SPARE
03	GENERATOR FAULT	03	SPARE
04	GENERATOR LOW FUEL	04	SPARE
05	ATS IN NORMAL		
06	ATS IN EMERGENCY		
07	ATS NORMAL SOURCE AVAILABLE		
08	ATS EMERGENCY SOURCE AVAILABLE		
09	CONTROL POWER AVAILABLE		
10	WELL PUMP IN REMOTE		
11	WELL PUMP RUNNING		
12	WELL PUMP FAULT		
13	WELL PUMP CV CLOSED		
14	SPARE		
15	SPARE		
DO			
SIGNAL DESCRIPTION			
01	WELL PUMP CALL TO RUN		
02	SPARE		
03	SPARE		
04	SPARE		
AI			
SIGNAL DESCRIPTION			
01	WELL LEVEL		
02	WELL FLOW		
03	WELL VFD SPEED		
04	SPARE		

200 W FORSYTH STREET, SUITE 1520
JACKSONVILLE, FLORIDA 32202
E6000072 AA0001992
AGUSTIN C. QUINONES PE FL 68295

NORTHWEST WELL NO. 7
WELLHEAD AND SITE
ST. JOHNS COUNTY UTILITY DEPARTMENT
ST. AUGUSTINE, FLORIDA

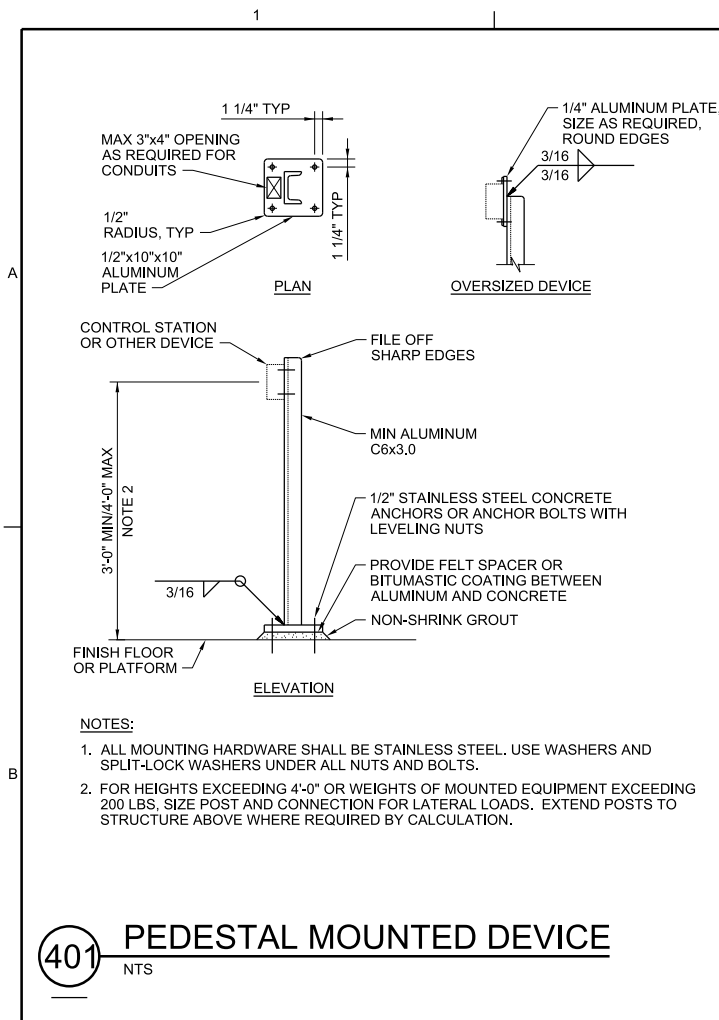
Jacobs
ELECTRICAL
TYPICAL SCADA SYSTEM

AS NOTED
VERIFY SCALE
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DATE MAY 2021
PROJ EGXM1300
DWG E-09
SHEET 23 of 26

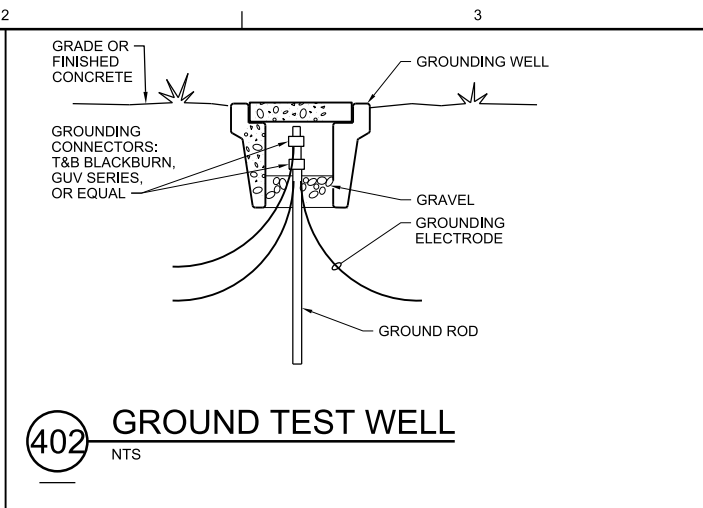
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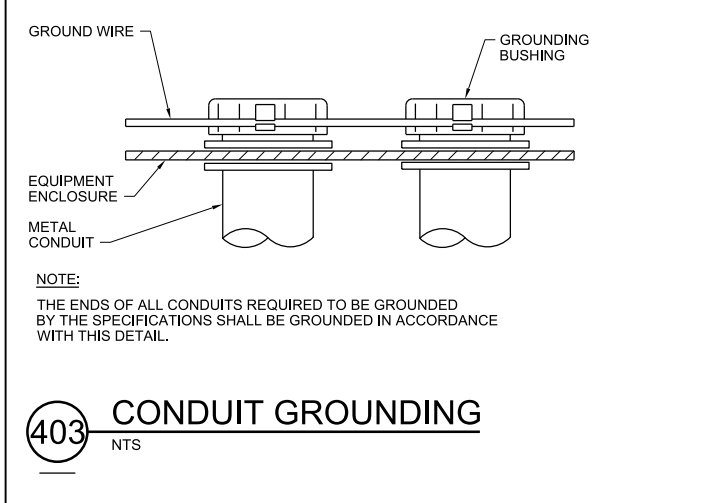
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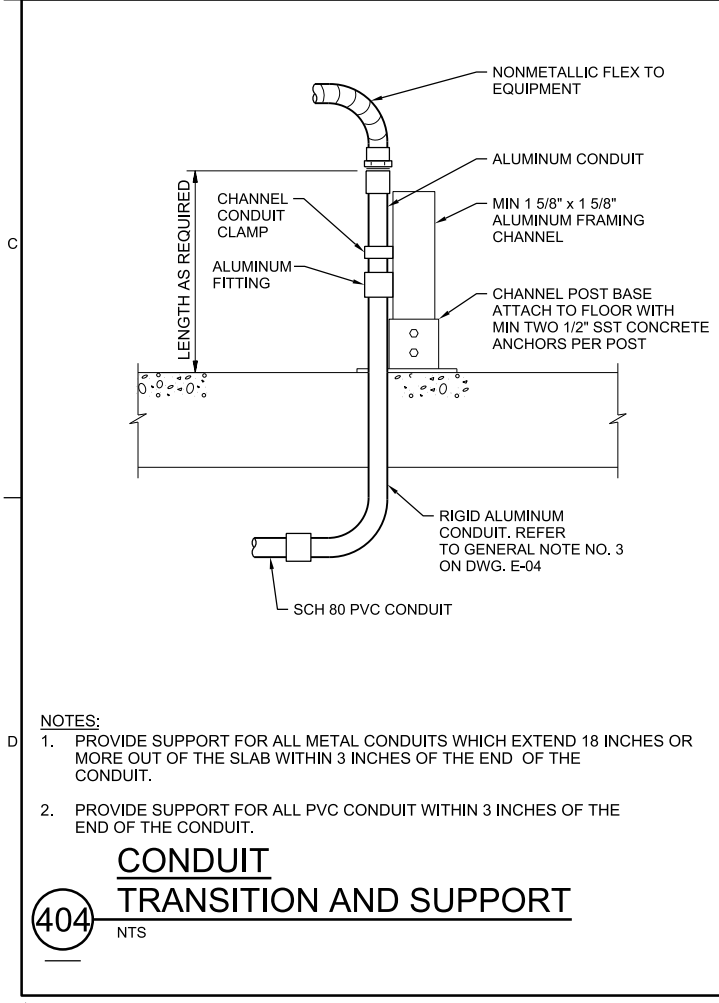
401 PEDESTAL MOUNTED DEVICE
NTS



402 GROUND TEST WELL
NTS

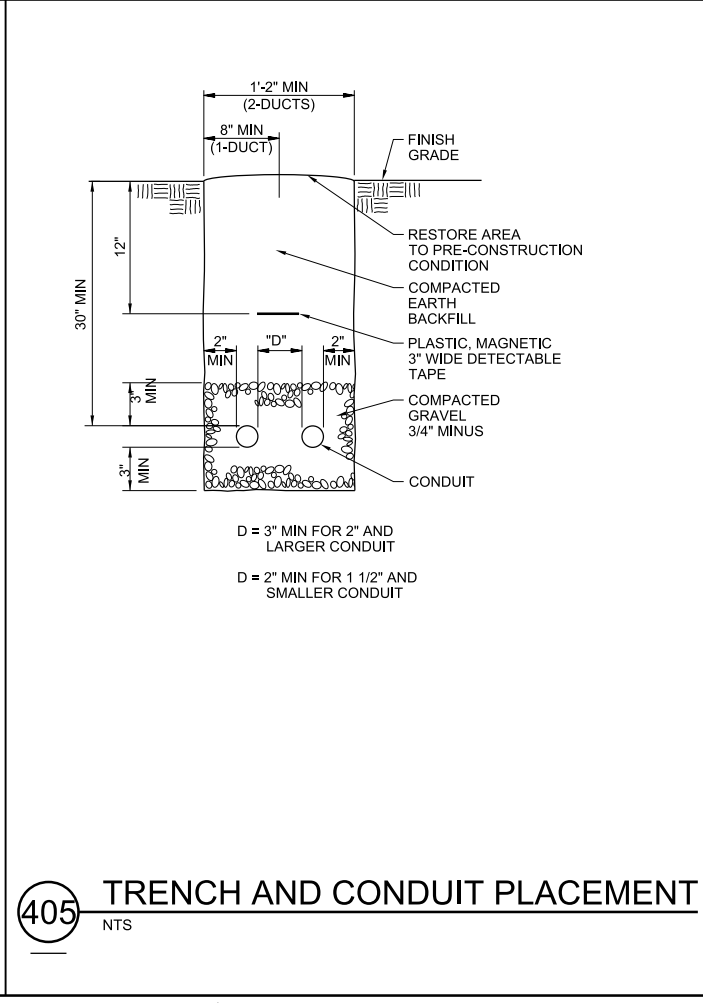


403 CONDUIT GROUNDING
NTS



- NOTES:
1. PROVIDE SUPPORT FOR ALL METAL CONDUITS WHICH EXTEND 18 INCHES OR MORE OUT OF THE SLAB WITHIN 3 INCHES OF THE END OF THE CONDUIT.
 2. PROVIDE SUPPORT FOR ALL PVC CONDUIT WITHIN 3 INCHES OF THE END OF THE CONDUIT.

404 CONDUIT TRANSITION AND SUPPORT
NTS

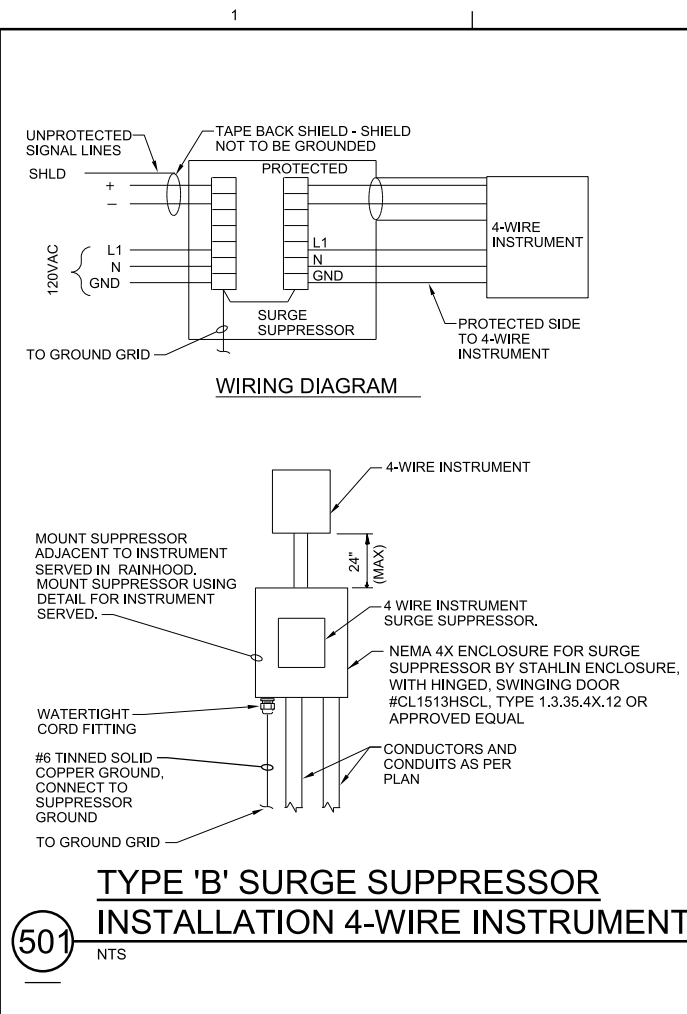


405 TRENCH AND CONDUIT PLACEMENT
NTS

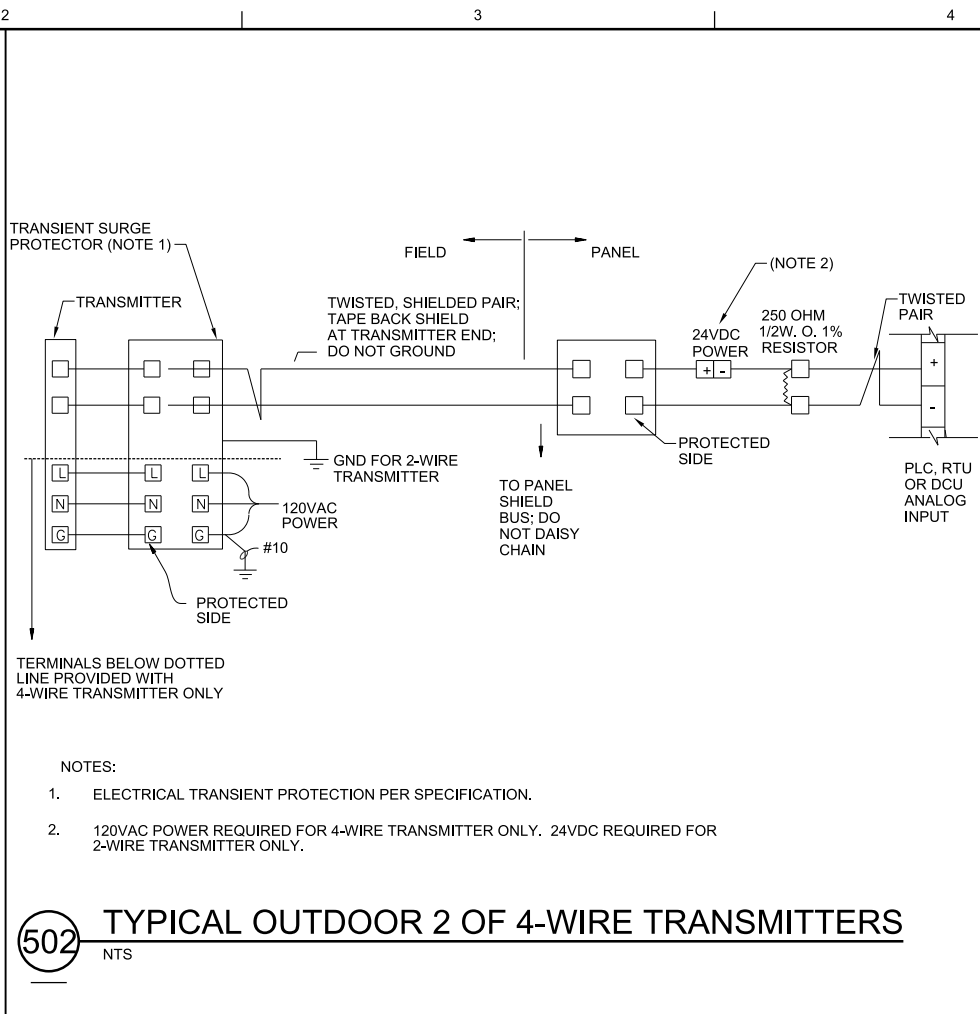


406 NOT USED
NTS

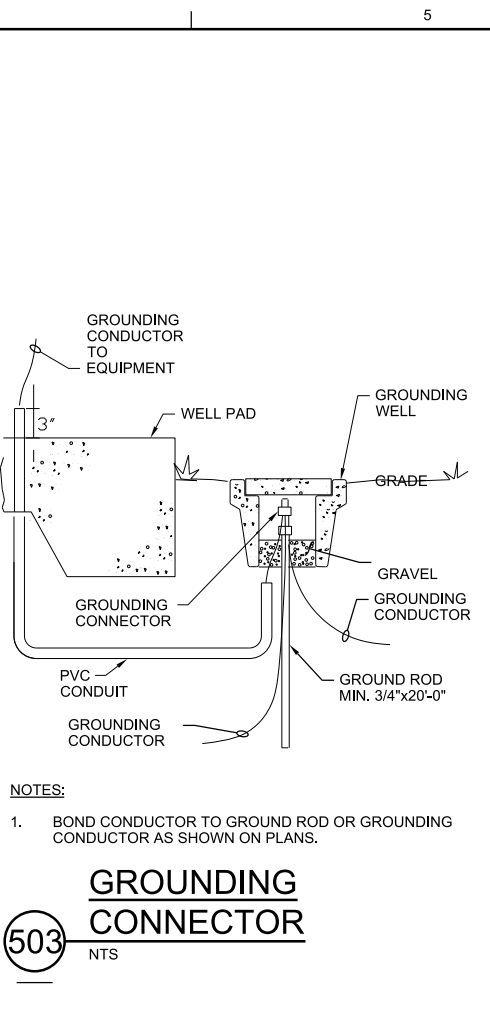
200 W FORSYTH STREET, SUITE 1520 JACKSONVILLE, FLORIDA 32202 E6000072 AA001992 AGUSTIN C. QUINONES PE FL 68295		NORTHWEST WELL NO. 7 WELLHEAD AND SITE ST. JOHNS COUNTY UTILITY DEPARTMENT ST. AUGUSTINE, FLORIDA	
<p>JACOBS</p>		<p>ELECTRICAL</p> <p>STANDARD DETAILS</p>	
DATE	MAY 2021	PROJ	EGXM1300
DWG	E-90	SHEET	24 of 26



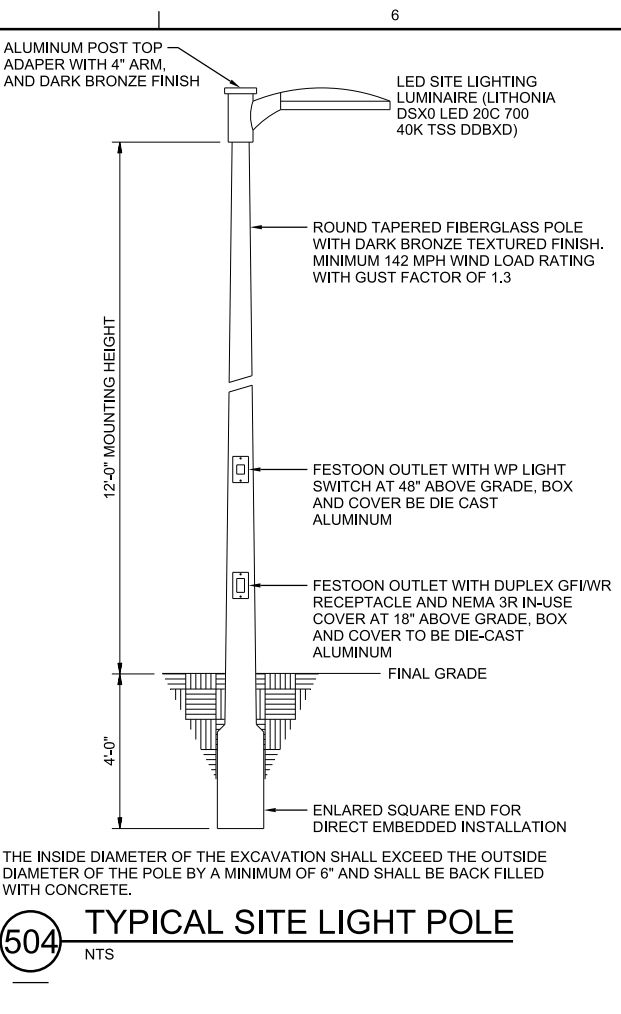
501 TYPE 'B' SURGE SUPPRESSOR INSTALLATION 4-WIRE INSTRUMENT
NTS



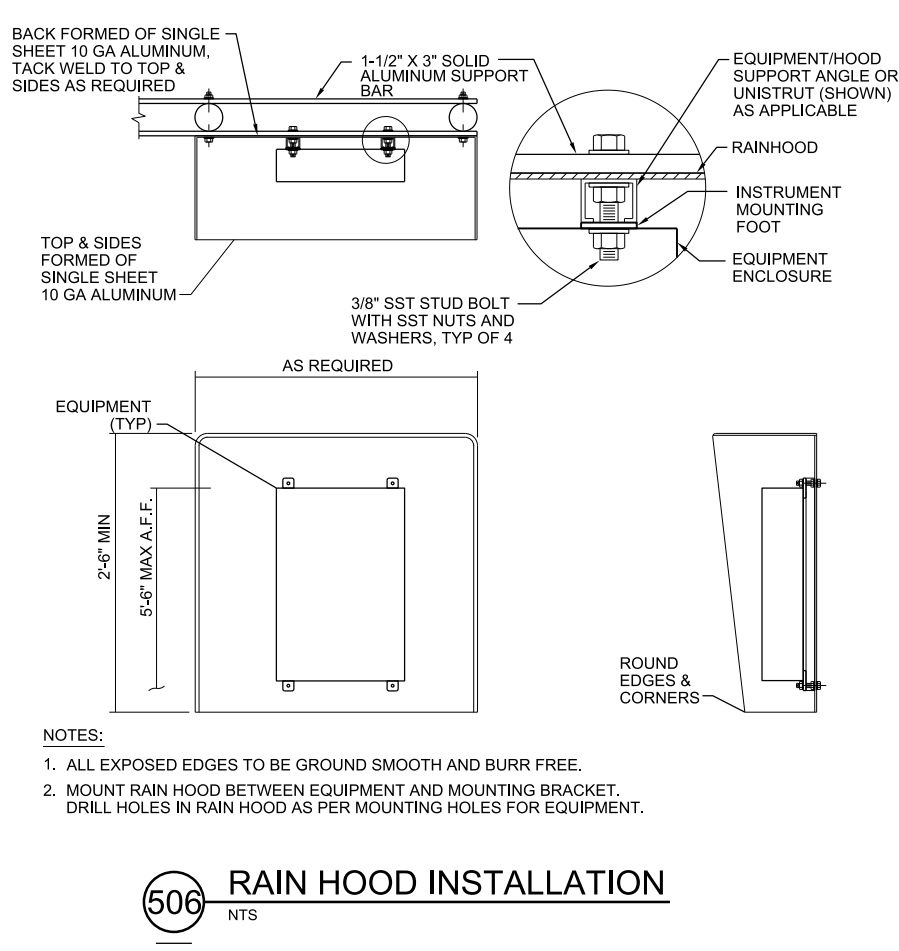
502 TYPICAL OUTDOOR 2 OF 4-WIRE TRANSMITTERS
NTS



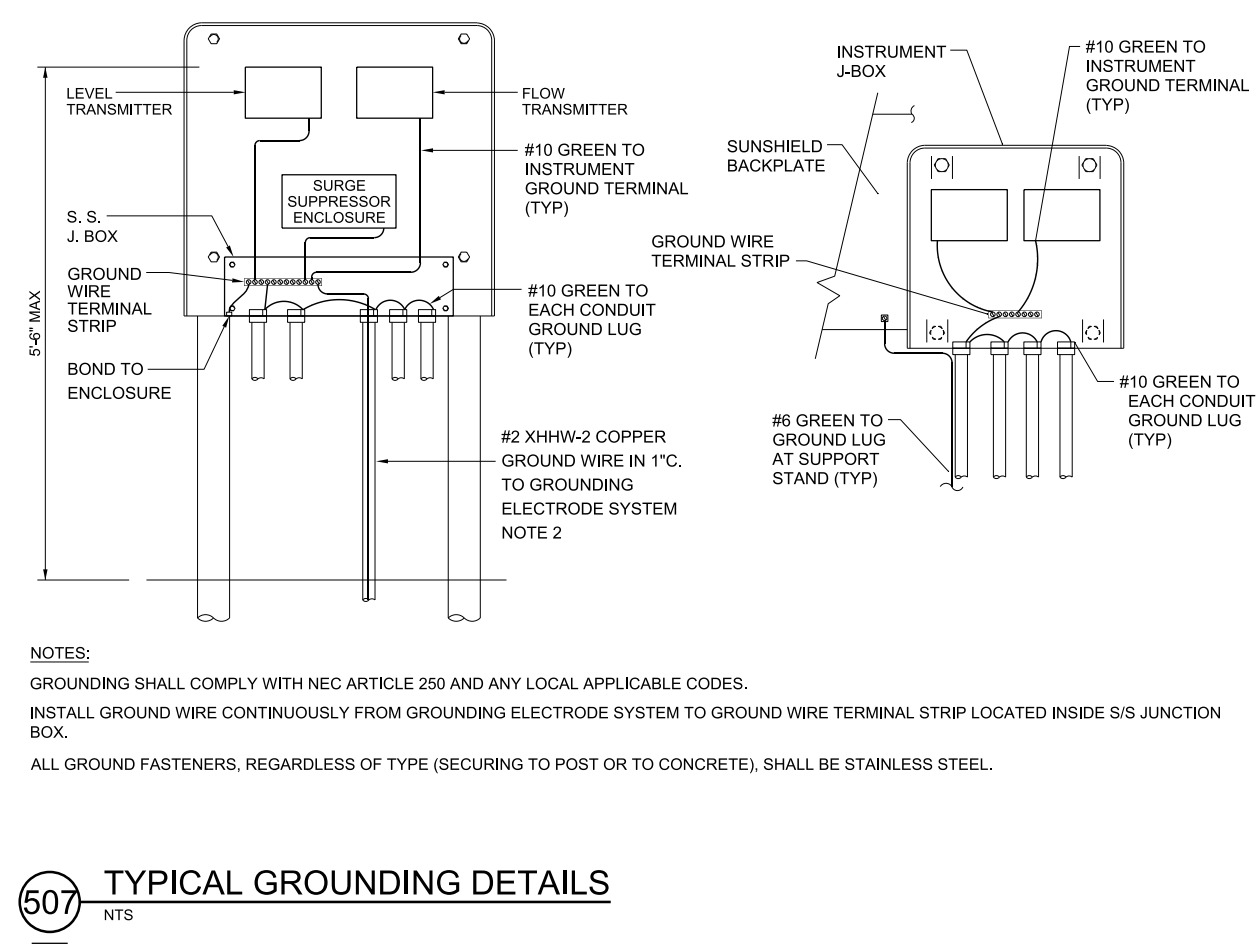
503 GROUNDING CONNECTOR
NTS



504 TYPICAL SITE LIGHT POLE
NTS



506 RAIN HOOD INSTALLATION
NTS



507 TYPICAL GROUNDING DETAILS
NTS

200 W FORSYTH STREET, SUITE 1520 JACKSONVILLE, FLORIDA 32202 E6000072 AGUSTIN C. QUINONES PE FL 68295		NORTHWEST WELL NO. 7 WELLHEAD AND SITE ST. JOHNS COUNTY UTILITY DEPARTMENT ST. AUGUSTINE, FLORIDA	
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JACOBS
ELECTRICAL
STANDARD DETAILS

NTS
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
DATE: MAY 2021
PROJ: EGXM1300
DWG: E-92
SHEET: 26 of 26



St. Johns County Board of County Commissioners

Purchasing Division

December 6, 2021

ADDENDUM #1

To: Prospective Bidders
From: St. Johns County Purchasing Department
Subject: Bid No. 22-34 Northwest No. 7 Wellhead and Site Improvements

This Addendum #1 is issued for further respondent's information and is hereby incorporated into the Bid documents. Each respondent will ascertain before submitting a proposal that he/she has received all Addenda. **Please return an original copy of this signed Addendum with your proposal to the St. Johns County Purchasing Department, David E. Pyle, CPPB; 500 San Sebastian View; St. Augustine, FL 32084.**

Change: Minimum Qualification of Contractors – replace paragraph one (1) with the following:

Prime bidder must be fully licensed to do business in the State of Florida and hold a valid Certified General Contractor's License or a valid certified Underground Utility License at the time the bid is due. Bidders must have successfully completed, as a Prime Contractor, at least three (3) projects, in the past five (5) years, of similar type, size and dollar value of the project described herein. One or more of these three (3) projects must include the installation of 12" and larger flanged and mechanical joint pipe, fittings, and valves, and a generator in a remote setting. The dollar value of similar projects must be at least 75% of the submitted bid. St. Johns County reserves the right to request additional information regarding qualifications and to use this information for the purpose of awarding a contract.

Questions/Answers:

1. Will the County allow a Certified Underground Utility Contractor to bid this project as well?

Answer: Yes; refer to the Change in the Minimum Qualification of Contractors above.

THE BID DUE DATE IS UNCHANGED: Wednesday, December 15, 2021 AT 2:00 P.M.

Acknowledgment

Sincerely,

Signature and Date

David E. Pyle, CPPB
Procurement Coordinator

Printed Name/Title

Company Name (Print)

END OF ADDENDUM NO. 1