

PROJECT MANUAL

FOR

WARMINSTER TOWNSHIP

CONTRACT NUMBER 2019-06

FIVE PONDS GOLF COURSE
IRRIGATION PROJECT

June 13, 2019

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Hydro Designs, Inc.
3 College Avenue, Suite 8
Frederick, MD 21701

**WARMINSTER TOWNSHIP CONTRACT NO. 2019-06
FIVE PONDS GOLF COURSE IRRIGATION PROJECT
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PART 1 - KEY DATES

Document Publication-----June 13, 2019
Board of Supervisors Meeting -----June 20, 2019
Pre-Bid Meeting -----July 10, 2019
Bids Due-----July 25, 2019
Commence Construction -----October 28, 2019
Substantial Completion -----March 2, 2020
Sign-Off-----March 16, 2020

PART 2 - BID ADVERTISEMENT

ADVERTISEMENT FOR BIDS

Warminster Township, located at 401 Gibson Avenue, Warminster, PA 18974, will receive sealed bids until 11:00 A.M., prevailing time on July 25, 2019, at which time and place the bids shall be publicly opened and read aloud for:

CN 2019-06 Five Ponds Golf Course Irrigation Project

This Project involves the installation of a new golf course irrigation system at Five Ponds Golf Course.

All Bid Documents and solicitation details are available at no cost at bids@warminster.org. A nominal fee of .25% of the bid amount (up to \$5,000) is assessed only to bidders who are awarded contracts.

Each bid shall be submitted in accordance with the Project's Instructions to Bidders, which shall be provided in the Bid Documents.

A pre-bid meeting will be held on July 10, 2019 starting at 10:00 A.M., prevailing time at Five Ponds Golf Course, 1225 West Street Road, Warminster, PA 18974. Attendance at this pre-bid meeting is mandatory.

This Project is subject to applicable provisions of Act 422, Pennsylvania Prevailing Wage Act, as amended, and the prevailing wage minimum rates issued by the Pennsylvania Department of Labor and Industry. The Project is subject to applicable requirements of the Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors], for work valued at over three hundred and fifty thousand dollars (\$350,000).

Warminster Township reserves the right to reject any and all bids for any cause whatsoever, to eliminate any item or items from the contract, and to waive any informality, defects, or irregularities in the bids.

Warminster Township is an equal opportunity employer and requires compliance with applicable equal opportunity laws.

Warminster Township
Dated: June 2019

PART 3 - INSTRUCTIONS TO BIDDERS

3.1 DEFINED TERMS

- A. Consultant - the individual responsible for the design and specifications, and to whom requests for clarification and product suitability are to be addressed. The Consultant is:

Hydro Designs, Inc.
Paul McMahon
3 College Avenue, Suite 8
Frederick, MD 21701
(301) 360-9663
(301) 471-7917 cell
paulmcmahon@hydrodesigns.com

Alternate Consultant contact is Michael Kroner at
michaelkroner@hydrodesigns.com.

- B. Township:

Mike Attara
Warminster Township
401 Gibson Avenue
Warminster, PA 18974
(267) 317-1369
mattara@warminsterpa.org

- C. Township's Representative: the individual representing Warminster Township and Five Ponds Golf Course for this Project. The Township's Representative is:

Kurt Jensen
Five Ponds Golf Course
1225 West Street Road
Warminster, PA 18974
(267) 317-1367
kjensen@warminsterpa.org

- D. Bidder: The individual or entity who submits a Bid directly to the Township.
- E. Bidding Documents: Project Manual, Addenda, and Drawings (Sheets I-1, I-2, and D-1).
- F. Project: Irrigation system installation for Five Ponds Golf Course in Warminster, Pennsylvania.
- G. Work: The furnishing of all supervision, labor, materials, tools, and equipment necessary to perform and complete the installation of the Project specified herein and as shown on the drawings and any incidental work not shown or specified which can reasonably be determined to be part of the Project and necessary to provide a complete and functional irrigation system.

- H. Bid Form: Part 4 of the Project Manual for Five Ponds Golf Course Irrigation Project. Bid Form is to be completed and submitted in accordance with Instructions to Bidders.
- I. Base Bid: Lump sum price for Work described in Section 6.2.A of this Project Manual.
- J. Bid Alternate: Lump sum price for work described in Section 6.2.B and 6.2.C of this Project Manual.
- K. Contract: The legally binding agreement between Warminster Township and the successful Bidder to perform the Work.
- L. Supporting Contract Documents: The Project Manual, drawings, addenda, and all modifications agreed to by the parties at any time during the construction period.

3.2 COPIES OF BIDDING DOCUMENTS

- A. Complete sets of the Bidding Documents are available online at no cost at bids@warminster.org.
- B. Complete sets of the Bidding Documents must be used in preparing Bids; Neither the Township nor the Consultant assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- C. The Township, in making copies of Bidding Documents available on the above terms, does so only for the purpose of obtaining Bids for the Work and does not confer a license or grant for any other use.

3.3 EXAMINATION OF BIDDING DOCUMENTS AND SITE

It is the responsibility of each Bidder before submitting a Bid:

- A. To examine thoroughly the Bidding Documents;
- B. To visit the site to become familiar with and satisfy Bidder as to the general, local, and site conditions that may affect cost, progress, performance, or furnishing of the Work;
- C. To consider federal, state, and local laws and regulations that may affect cost, progress, performance, or furnishing of the Work;

- D. To study and carefully correlate Bidder's knowledge and observations with the Bidding Documents and other such related data; and
- E. To promptly notify the Township of all conflicts, errors, ambiguities or discrepancies which Bidder has discovered in or between the Bidding Documents and such other related documents.

3.4 INTERPRETATIONS AND ADDENDA

All questions about the meaning or intent of the Bidding Documents are to be directed to the Consultant. Interpretations or clarifications considered necessary by Consultant in response to such questions will be issued by Addenda sent to all parties recorded by the Township as having received the Bidding Documents. Only answers issued by Addenda will be binding. Oral and other non-addenda interpretations or clarifications will be without legal effect.

3.5 RESPONSIBLE CONTRACTOR ORDINANCE

The Project is subject to applicable requirements of the Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors], for work valued at over three hundred and fifty thousand dollars (\$350,000). Bidder must review the requirements outlined in Appendix A and submit a completed Warminster Township's Contractor Responsibility Certification, attached as Appendix B, with the Bid.

3.6 PREVAILING WAGE RATES

This Project is subject to applicable provisions of Act 422, Pennsylvania Prevailing Wage Act as amended, and the prevailing wage minimum rates issued by the Pennsylvania Department of Labor and Industry. Current prevailing wage rates are listed in Appendix C.

3.7 PRE-BID MEETING

A pre-bid meeting will be held on July 10, 2019 starting at 10:00 A.M. prevailing time at Five Ponds Golf Course, 1225 West Street Road, Warminster, PA 18974. The Consultant and a representative of the Township will be present to discuss the Project. Attendance at this pre-bid meeting is mandatory.

3.8 BID FORM

- A. The Bid Form is included with the Bidding Documents.
- B. All blanks on the Bid Form must be completed by printing in black ink or with a word processor.

- C. Bids by corporations must be executed in the corporate name or by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.
- D. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- E. All names must be typed or printed in black or blue ink.
- F. The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).
- G. The address, telephone number, and email address for communications regarding the Bid must be shown.
- H. Evidence of authority to conduct business as an out-of-state corporation in the state where the work is to be performed shall be provided.

3.9 BID BOND

Bids must be accompanied by a bid deposit. The bid deposit shall be an amount equal to 5 percent of the Bidder's maximum bid price (including alternate items), payable to the Township of Warminster, PA. The bid security will be retained until the successful bidder has executed a contract with the Township, whereupon it will be returned.

3.10 PERFORMANCE AND PAYMENT BOND

- A. Bidder will submit an executed bond in the amount of one hundred percent (100%) of the acceptable bid with the executed contract as security for faithful performance of this contract. Failure to submit a performance bond with the contract shall be cause for declaring the contract null and void.
- B. With the delivery of the performance bond, the Bidder will submit an executed payment bond to guarantee payment to laborers and suppliers for labor and material used in the performance of this contract.

3.11 BIDDER QUALIFICATIONS

- A. Bidder must complete the Warminster Township's Contractor Responsibility Certification in Appendix B.

- B. Bidder must have experience in the installation of golf course irrigation systems and the installation of fused, high-density polyethylene (HDPE) pipe. The Contractor is to include five projects of similar scope completed within the last ten years in the Work History section (3.1) of Warminster Township's Contractor Responsibility Certification. At least three of the references must be projects involving HDPE fusion.

3.12 SUBMISSION OF BIDS

- A. Bids are due at the office of the Warminster Township, 401 Gibson Avenue, Warminster, PA 18974, before 11:00 A.M. prevailing time on July 25, 2019, at which time and place the bids shall be publicly opened and read aloud.
- B. Bids are to be submitted in an opaque and sealed envelope with the following information typed on the outside of the envelope:
 - 1. Bidder name and address;
 - 2. Project name (Five Ponds Golf Course Irrigation Project); and
 - 3. Contract number (CN 2019-06).
- C. Bidders shall submit a Bid on a lump sum basis for the Base Bid and include a separate price for each Add Option described in the Bidding Documents. The amount for each Add Option will be the amount to be added to the Base Bid if the Township selects the Add Option.
- D. Bidder is to submit the following:
 - 1. Bid Form completed and signed.
 - 2. Unit Pricing Schedule (two pages).
 - 3. Warminster Township's Contractor Responsibility Certification (Appendix B).
 - 4. Bid Bond equal to five (5) percent of the Bidder's maximum bid.

3.13 EVALUATION OF BIDS

- A. Warminster Township reserves the right to reject any or all Bids, including, without limitation, nonconforming, non-responsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Township may also reject the Bid of any Bidder if the Township believes that it would not be in the best interest of the Project to make an award to that Bidder due to

noncompliance with the Instructions to Bidders and/or prior work history of the Bidder.

- B. Warminster Township reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the successful Bidder.

3.14 MODIFICATION AND WITHDRAWAL OF BIDS

- A. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
- B. If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with the Township and promptly thereafter demonstrates to the reasonable satisfaction of the Township that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract.

3.15 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All Bids will remain subject to acceptance for sixty (60) days after the day of the Bid opening, but the Township may, in its sole discretion, release any Bid prior to that date.

3.16 AWARD OF BID

If the Contract is to be awarded, Warminster Township will award the Contract to the lowest responsible and responsive Bidder whose Bid is in the best interests of the Project, based on the Base Bid only. Alternates provided by the lowest Bidder may be awarded at the Township's discretion.

3.17 SIGNING OF CONTRACT

The successful Bidder shall be required to enter into a written Contract with Warminster Township consistent with the terms of the Project Manual, to the satisfaction of the Township Solicitor.

PART 4 - BID FORM

Five Ponds Golf Course Irrigation Project
Warminster, PA
Contract Number 2019-06

I/We of _____ the undersigned, having carefully examined the conditions affecting the work defined by the drawings and specifications, do hereby offer to furnish all materials, labor, tools, equipment, machinery, insurance, taxes and services necessary to complete the construction of the golf course irrigation system at Five Ponds Golf Course in Warminster, PA, in accordance with Drawings and Specifications dated June 13, 2019, including Addenda Nos. _____ through _____, issued prior to date of opening of Bids, which is hereby acknowledged, for the following considerations.

Base Bid

The sum of _____ Dollars \$ _____

Bid Alternate 1: Weather Station, Additional Control System and Spare Parts

The sum of _____ Dollars \$ _____

Bid Alternate 2: Irrigation of Range Fairway

The sum of _____ Dollars \$ _____

The Bidder understands that the Township reserves the right to reject this Bid.

The Bidder also agrees that this bid shall be good and may not be withdrawn (except as noted in the Instructions to Bidders) for a period of thirty calendar days after the scheduled closing time for receiving bids.

Company Name: _____

Street Address: _____

City/State/Zip Code: _____

Phone: _____

Email: _____

Signed: _____

Printed: _____

Date: _____

Five Ponds Golf Course Irrigation Project
 Warminster, PA
 Contract Number 2019-06

Irrigation System Bid Unit Pricing

Bidder: _____ Date: _____

The following unit pricing is to be used for minor additions to and deletions from the specified design; and to assist in determination of responsiveness of bid.

Item	Unit Price
60 ft full circle VIH sprinkler	_____
75 ft full circle VIH sprinkler	_____
90 ft full circle VIH sprinkler	_____
40 ft part circle VIH sprinkler	_____
60 ft part circle VIH sprinkler	_____
75 ft part circle VIH sprinkler	_____
15 ft spray head with rotating nozzle	_____
40 ft part circle pop-up sprinkler	_____
1" quick coupling valve	_____

The prices for the preceding hardware include installation of sprinklers and associated equipment such as swing joint, service saddle on 2" pipe, wire installed with 2" pipe (length is the head spacing from the drawing legend, plus 10 ft), 2" pipe, bedding, backfill, splice kits, clean-up, etc. All valves and VIH sprinklers are to include IC module or smart module.

1.5" DR 13.5 HDPE pipe, per foot	_____
2" DR 13.5 HDPE pipe, per foot	_____
3" DR 13.5 HDPE pipe, per foot	_____
4" DR 13.5 HDPE pipe, per foot	_____
6" DR 13.5 HDPE pipe, per foot	_____
8" DR 13.5 HDPE pipe, per foot	_____
12" DR 13.5 HDPE pipe, per foot	_____

The prices for the preceding pipe include installation, backfill, and restoration of trench.

1" electric remote-control valve with pressure regulation and decoder	_____
1.5" electric remote-control valve with pressure regulation and decoder	_____
Drain valve assembly on lateral	_____
Drain valve assembly on main	_____
Air valve assembly	_____
2" SS lateral isolation valve	_____
3" SS lateral isolation valve	_____
3" ductile iron valve, flanged	_____
4" ductile iron valve, flanged	_____
6" ductile iron valve, flanged	_____
8" ductile iron valve, flanged	_____

The prices for the preceding isolation valves include installation and incidental costs such as pipe adapters, concrete thrust blocks, valve boxes, etc.

Toro Smart Hub	_____
Weather station, Toro	_____
Weather station, Rain Bird	_____
#14/2 decoder cable, Toro, per foot	_____
#14/2 decoder cable, Rain Bird, per foot	_____
Smart Hub/ICI ground grid, installed	_____
Toro surge arrestor, installed with ground plate	_____
Rain Bird surge arrestor, installed with ground plate	_____
Deleterious material, per cubic yard	_____

PART 5 - GENERAL SPECIFICATIONS

5.1 PURPOSE OF SPECIFICATIONS

The purpose of these specifications is to provide the Contractor with sufficient information which, together with the drawings, will allow the Contractor to install the irrigation system (the Project) in an efficient, timely and satisfactory manner in accordance with the highest standards of workmanship for golf course irrigation system installation so that the completed system shall effectively and efficiently irrigate all required areas, be complete in every respect, and operate to the satisfaction of the Township.

5.2 SCOPE OF WORK

- A. The Work covered by these specifications shall include furnishing of all supervision, labor, materials, tools, and equipment necessary to perform and complete the installation of the Project specified herein and as shown on the drawings and any incidental work not shown or specified which can reasonably be determined to be part of the Work and necessary to provide a complete and functional system.
- B. The Contractor shall procure and maintain in full force and effect all necessary or required permits, and shall pay or discharge, prior to the completion of the Project, all mechanics' liens, all federal, state, and local taxes and any other costs associated or incidental to the Project, whether or not foreseeable at the time of or during construction.
- C. No deviation from these specifications, drawings or Agreement shall be made without the prior written authorization of the Township or his representative.

5.3 DEFINITION AND INTENT OF DOCUMENTS

- A. The "Supporting Contract Documents" consist of the Project Manual, drawings, addenda, and all modifications agreed to by the parties at any time during the construction period. They are complimentary and shall be interpreted as a whole in accordance with the laws of the State of Pennsylvania.
- B. Until the Contract is executed, the Contractor shall comply with the true intent of the "Supporting Contract Documents". Indicated dimensions on drawings shall take precedence over scaled measurements. Detailed installation drawings supplied by Consultant shall take precedence over any general drawing provided.

5.4 EXAMINATION AND VERIFICATION OF DRAWINGS AND SITE

- A. All plot plan dimensions are approximate. Drawings are generally diagrammatic and indicative of the work to be performed. Due to the scale of the drawings it is not possible to indicate all offsets, fittings, sleeves, etc. which may be required.
- B. When furnished, Manufacturers' directions, specifications, and detailed drawings shall be followed in all cases with regard to points not shown in the "Contract Documents". The Contractor shall inform the Consultant of any discrepancies between manufacturers' directions and the "Contract Documents", and such discrepancies shall be resolved in writing by the Consultant before work is done in connection therewith.
- C. Prior to commencing work on the Project, the Contractor shall carefully check and verify all dimensions and shall make a written report to the Consultant of any discrepancy or variation from those shown on the plot plan, and such discrepancy or variation shall be resolved by the Consultant in writing before any work with regard thereto is commenced. If installed equipment requires replacement or reinstallation as a result of any unresolved discrepancy or variation, it shall be at the Contractor's expense.

5.5 TOWNSHIP'S AUTHORIZED REPRESENTATIVE

The Township shall appoint a representative to work with the Contractor, who shall have full authority to make field changes deemed necessary, approve work performed by the Contractor and approve the Contractor's requests for payment. The Contractor shall be kept advised, in writing, of the current such representative's name, address and telephone number. Whenever the Township's action is required under the "Contract Documents", action by said representative shall be deemed the action of the Township. No other person shall have such authority and no changes or approvals given by any other person, including, without limitation, the Consultant or Golf Course Superintendent, shall be valid or binding on the Township.

5.6 REGULATIONS, PERMITS, FEES, AND INSPECTIONS

- A. The Contractor shall procure and pay for all temporary permits and licenses necessary to the prosecution and completion of the work.
- B. Permits, licenses, and easements for permanent structures or permanent changes to existing facilities shall be procured by and paid for by the Contractor, unless otherwise specified.

- C. Local, municipal, state, and federal laws, ordinances, rules and regulations governing or relating to any portion of the Project are hereby incorporated into and made part of these specifications and nothing contained herein shall be construed or interpreted to conflict therewith. However, when these specifications and drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required thereby, the provisions of the specifications and drawings shall take precedence.
- D. In the event of any conflict with said laws, ordinances, rules or regulations, the Contractor shall promptly give the Township written notification thereof, and the Township shall thereupon resolve such conflict in writing. If the Contractor performs any work contrary to such laws, ordinances, rules and regulations, without notice to and prior written consent by the Township, the Contractor shall be liable for all costs arising therefrom, including but not limited to the change and correction thereof.
- E. In all cases where inspection of the irrigation system work is required or where portions of the work are specified to be performed under the direction of the Township, the Contractor shall notify the Township at least 24 hours prior to the time when such inspection and/or direction is required. Any necessary re-excavation or change to the system occasioned by the failure of the Contractor to give the required notification shall be performed at the Contractor's expense.

5.7 PROTECTION OF WORK AND PROPERTY

- A. The Contractor shall be liable for any damage resulting from the Contractor's operations, to existing buildings, equipment, piping, pipe coverings, electrical systems, sewers, sidewalks, roads, grounds, landscaping, or structure of any kind, occurring during the course of or as a result of the Contractor's work, whether through negligence or otherwise. Such damaged property shall be replaced or repaired by the Contractor at the Contractor's own expense in a manner satisfactory to the Township, which repair or replacement shall be a condition precedent to the Township's obligation to make final payment under the Contract.
- B. The Contractor shall be responsible for damage to any work, completed or otherwise covered by this specification before final acceptance of the work. The Contractor shall securely cover all openings into the system (i.e. unfinished pipelines) and cover all apparatus, equipment, and appliances, both before and

after being set in place to prevent obstructions in the pipes and the breakage, misuse, or disfigurement of the apparatus, equipment, or appliance.

- C. The Contractor shall adequately protect adjacent property as provided by law and the Contract Documents.

5.8 SUPERVISION

- A. The Contractor shall at all times have a competent superintendent acceptable to the Township, and any necessary assistants, on the site of the work to ensure complete compliance with the Contract Documents.
- B. The superintendent shall represent the Contractor and all directions given to the superintendent shall be as binding as if given to the Contractor.

5.9 CONTRACTOR AS AN INDEPENDENT CONTRACTOR

The Contractor is an independent contractor and shall, at the Contractor's sole cost and expense, and without increase in the Contract Price, comply with all laws, rules, ordinances, and regulations of all governing bodies having jurisdiction over the work; obtain all necessary permits and licenses therefore; pay all manufacturer's taxes, sales taxes, use taxes, processing taxes, and all federal and state taxes; provide liability insurance protecting both the Contractor and the Township from all risks and perils inherent in work of the kind and nature contemplated hereby; make appropriate provisions for withholding taxes for the Contractor's employees and contributions for Social Security, Worker's Compensation and unemployment insurance benefits which are measured by wages, salaries, or other remuneration paid to the Contractor's employees, whether levied under existing or subsequently enacted laws, rules, or regulations. The Contractor, upon request, shall furnish evidence satisfactory to the Township that any and all of the foregoing obligations have been fulfilled.

5.10 MATERIALS AND EQUIPMENT FURNISHED BY OTHERS

- A. In the event the scope of work includes installation of materials or equipment furnished by others, it shall be the responsibility of the Contractor to examine the items so provided and thereupon handle, store, and install the items with such skill and care as to ensure satisfactory completion of the Project.
- B. Loss or damage due to acts of Contractor shall be charged to the account of the Contractor and deducted from moneys due by the Township to the Contractor under this Agreement; or, if exceeding the amount due the Contractor, shall be payable by the Contractor to the Township upon demand.

5.11 CERTIFICATES OF PAYMENT - NOTICE OF COMPLETION

- A. The completion of the contract will be accepted, and the Notice of Completion recorded only when the entire Project is complete to the satisfaction of the Consultant and the Township. Completion of contract implies that all intended areas of the Project are irrigated as shown on the drawings, the irrigation system operates automatically as intended, operations and maintenance manuals have been delivered to the Consultant, and operator training has been completed.
- B. No certificate issued, or payment made to the Contractor shall be construed or interpreted as an acceptance of any work or materials not in accordance with this Agreement.
- C. Partial or complete occupancy of the work by the Township shall not be construed or interpreted as an acceptance of any work or materials not in accordance with this Agreement.
- D. The acceptance of the final payment by the Contractor shall constitute a waiver of all claims by the Contractor, other than those arising from unsettled liens or unsettled claims previously made in writing.

5.12 PROGRESS PAYMENTS

- A. Once each month, the Contractor shall submit to the Township an invoice for all work performed during the previous pay period.
- B. Major materials may be invoiced with the next regular progress payment request after their delivery to the job site and evidence of their issuance. Invoices covering the materials billed and evidence that they are insured at the Project site shall accompany the Contractor's request for payment.
- C. Lien releases covering work and materials paid for by the Township shall accompany the next progressive payment request.
- D. Progress payment request invoices shall be paid by the Township in the amount of 90% of the invoice amount (except 100% will be paid on major materials) with 10% maximum retainage.
- E. All retainage will be paid to the Contractor within 30 calendar days after final acceptance of the Project by the Township.
- F. Lien releases covering all labor and materials furnished on the Project must be received by the Township prior to payment of retainage.

- G. Payment by the Township to the Contractor for materials delivered shall not constitute acceptance of the materials by the Township.
- H. The Township assumes no responsibility or ownership of materials and/or work until the making and acceptance of the final retainage payment.

5.13 COMPENSATION FOR ADDITIONS AND DELETIONS

- A. Additions to or deletions from the Project of unit priced items will be reimbursed to the Contractor or credited to the Township (as applicable) based upon the unit prices listed on the Bid Form.
- B. Compensation for additions to the Project of unit priced items involving main pipelines, water services, electrical services, sizable additions to area of coverage, etc., will be determined on a time and material basis and paid to the Contractor only pursuant to a formal written change order request submitted by the Contractor and approved and signed by the Township prior to the Contractor's incurrence of any such costs.
- C. The Contractor will submit an itemized invoice covering all labor and materials (if applicable) for the additions at the Contractor's cost, to which a reasonable percentage for overhead and profit will be added.
- D. All changes, deletions, and additions shall be approved in advance and in writing by the Township pursuant to a formal written change order request submitted by the Contractor and approved and signed by the Township prior to the Contractor's incurrence of any such costs and prior to incorporation of said change in the work.

5.14 DAMAGES

If the Township should suffer damage in any manner because of any act of the Contractor or of anyone employed by the Contractor, whether as the Contractor's employee, agent, or subcontractor, the Township shall be fully reimbursed by the Contractor within five (5) business days for such damage and the same may be deducted by the Township from any amount due the Contractor by the Township under the contract, and, if they exceed the amount due the Contractor, shall be payable by the Contractor to the Township upon demand.

5.15 DAMAGES DUE TO DELAY

- A. Should the Contractor default in the performance of his work, thereby causing a delay to the substantial completion of the Project, the Contractor shall be liable

for any and all losses and damages, including liquidating damages sustained therefore by the Township.

- B. The Contractor shall not be liable if the default was caused by acts of God, strikes, lockouts, provided immediate notice of the occurrence of the same has been provided in writing by the Contractor to the Township.

5.16 DAMAGES TO WORK IN PLACE

The Contractor shall be liable for any loss or damage to any work in place or to any equipment and materials on the Project site caused by the Contractor, the Contractor's agents, employees, or guests.

5.17 CLEAN-UP OF WORK SITE

- A. The Contractor shall, during the course of construction and on a daily basis at the end of each workday remove all waste materials from the site recurrently as is necessary to maintain the site in a clean and orderly condition at all times.
- B. Upon completion of the work under this contract, the Contractor shall remove from the work site all temporary structures, debris, and waste due to the Contractor's operations and clean all surfaces, equipment, etc., relative to the performance of this Agreement.
- C. If the Contractor fails to perform a clean-up function within forty-eight hours after notification by the Township to do so, the Township may proceed with the clean-up function as it deems necessary and in the manner deemed most expedient, and all costs thereof shall be at the sole expense of the Contractor, and shall be deducted from moneys due under this contract by the Township to the Contractor; and, if exceeding the amount owed the Contractor, shall be payable by the Contractor to the Township upon demand.

5.18 CHANGES TO SCOPE OF WORK

- A. The Contractor hereby agrees, without nullifying this Agreement, to make any and all changes or deviations from the original plans and specifications, when specifically directed to do so in writing by the Township.
- B. Prior to commencing any of the revised work, the Contractor shall immediately submit to the Township a written cost or credit proposal for the revised work.
- C. The Contractor shall adhere to the plans and specifications unless a deviation or change is authorized by the Township in writing. Terms of said deviation or

change shall be understood and agreed upon in writing by the Contractor and the Township prior to commencing the revised work.

- D. Reimbursement for additional work or deviation from the plans and specifications performed without written authorization will be at the sole discretion of the Township.

5.19 INSURANCE/INDEMNIFICATION

- A. The Contractor shall purchase and maintain throughout the course of the Work such insurance as will protect the Contractor and the Township, as an additional insured, from claims and damages that may arise out of or result from the Contractor's operations (whether by itself, any Sub-Contractors or suppliers, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable), including (without limitation) (i) claims under workers' compensation, disability benefit, and other similar employee benefit acts; (ii) claims for damages because of bodily injury, occupational sickness or disease, or death of its employees or any other person; (iii) claims for damages sustained by any person other than the Contractor's employees as a result of the actions of the Contractor, any Sub-Contractors or suppliers, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable; and (iv) claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.
- B. Without limiting the generality of the above paragraph, and as will be more fully set forth in the Contract, the Contractor shall maintain at a minimum the following types and amounts of insurance:
 - 1. Commercial General Liability (CGL) Insurance, including coverage for premises and operations, independent contractors, personal injury, advertising injury, product and completed operations, explosion, collapse and underground, and broad form contractual liability with limits of not less than \$2,000,000 per occurrence and \$2,000,000 in the aggregate.
 - 2. Business Automobile Liability Insurance with a limit of not less than \$1,000,000 combined single limit for bodily injury and property damage covering all owned (if any), non-owned, hired, and/or borrowed vehicles on site or off site. If vehicle is above a Class 2 classification then \$2,000,000 combined single limit for bodily injury and property damage covering all owned (if any), non-owned, hired, and/or borrowed vehicles on site or off

site is required. If any hazardous substances are transported coverage must include an MCS-90 endorsement and Motor Carriers Act of 1980 coverage applicable in the jurisdiction where the operations of the insured are performed.

3. Workers' Compensation and Employer's Liability Insurance with statutory workers' compensation (Coverage A) limits and employer's liability (Coverage B) limits of \$1,000,000 bodily injury by accident, each accident, and \$1,000,000 bodily injury by disease, each employee.
 4. An Umbrella or Excess Policy may be used to meet the CGL and Business Automobile Liability insurance requirements stated above. An Umbrella or excess policy may also be used to meet limits of required insurance below if the policy explicitly extends to those coverages.
- C. Prior to commencing the Contracted Services and upon any renewal of the Contractor's insurance policies, the Contractor shall promptly provide the Township with updated certificates of insurance evidencing continued compliance with the foregoing requirements. With respect to any coverage carried on a claims-made (and reported) basis, the (i) retroactive date shall be noted on the Certificate of Insurance and shall be prior to or the day of the commencement of the Contractor's services under this Agreement and (ii) evidence of coverage shall be provided for five (5) years beyond expiration of this Agreement (or an extended discovery period shall be exercised).
- D. Any property or work to be provided by the Contractor under this Contract will remain at the Contractor's risk until final written acceptance by the Township. The Contractor will replace, at its expense, all property or work lost, damaged, or destroyed by any cause whatsoever.
- E. The Contractor shall indemnify shall and will release, indemnify, protect and save harmless Township from all losses, damages, costs or expenses resulting from any and all loss of life, property, injury, or damage to any person or property of any person, association or persons, or corporation including the Township, its employees and independent contractors and employees of independent contractors, and from and against any and all claims, demands or actions for such loss, injury or damage, in any manner arising out of, resulting from, or connected with the Contract or Contracted Services, provided that (a) any such claims are not the result of the court-determined gross negligence or

willful misconduct of Township; (b) the Contractor shall have received from Township prompt written notice of any such claim, demand or action, with the Township's authorization permitting the Contractor to defend such claim; and (c) Township shall cooperate with the Contractor on any defense at the cost of the Contractor.

5.20 TOWNSHIP'S RECOURSE

- A. In the event that the Contractor at any time refuses or neglects to supply a sufficient number of properly skilled workmen or a sufficient quantity of materials of proper quality, or in effect be adjudicated as bankrupt, or files an arrangement proceeding, or commits any act of insolvency, or makes an assignment for the benefit of creditors, without the Township's written consent, or fails to make prompt payment to the Contractor's material suppliers or laborers, or fails in any respect to properly and diligently prosecute the work covered by this Agreement, or becomes delinquent with respect to contributions or payments required to be made to any health and welfare, pension, vacation, apprenticeship, or other employee benefit program or trust, or otherwise fails to perform fully any and all of the provisions herein contained, and fails to correct or otherwise alleviate such condition to the Township's satisfaction within forty-eight hours after demand therefor by the Township, the Township may, at its option, terminate the Contractor's right to proceed with the work and, in that event, the Township shall have the right to enter upon the Project site and take possession, for the purpose of completing the work included under this Agreement, of all materials, tools, and appliances thereof, and may employ any other person or persons to finish the work (including subcontractors, employees, and/or agents of the Contractor) and provide the materials therefor and provide all labor and materials as may be necessary therefor, and deduct the cost thereof from any money then due or thereafter to become due to the Contractor under this Agreement.
- B. In case of such discontinuance of the Contractor's right to proceed with the work, said Contractor shall not be entitled to receive any further payment, under this Agreement until the work undertaken by the Township is completely finished.
- C. If the unpaid balance of the amount to be paid under this Agreement exceeds the expenses incurred by the Township in finishing the Contractor's work, such

excess shall be paid by the Township to the Contractor; but, if such expense shall exceed such unpaid balance, then the Contractor shall promptly pay to the Township the amount by which such expense exceeds such unpaid balance upon demand.

- D. The expense incurred by the Township as herein provided, either for furnishing materials or for finishing work, and any damages incurred by the Township, by reason of the Contractor's default, shall be chargeable to, and paid by the Contractor, and the Township, in addition to all other remedies available at law and in equity, shall have a lien upon all materials, tools, and appliances, taken possession of, as aforesaid, to secure payment thereof.

PART 6 - IRRIGATION SPECIFICATIONS

6.1 SCOPE OF WORK

- A. The Work includes the installation of the following:
 - 1. an irrigation system for all 18 holes of the golf course and the practice areas;
 - 2. a new central control system, Toro Smart Hub controllers or Rain Bird IC Interface; decoders, and associated wiring;
 - 3. weather station;
 - 4. sprinklers, quick couplers, valves, and associated pipe network; and
 - 5. connection to existing pump station discharge pipe.

6.2 BASE BID AND OPTIONS

- A. The base bid is to include installation of all pipe, wire, sprinklers, valves, control system equipment needed to irrigate all eighteen (18) golf holes, the practice range tee, and the practice fairway target greens (three large VIH sprinklers and associated pipe, wire, and fittings).
- B. Bid Alternate 1 is to include the following:
 - 1. Weather Station;
 - 2. Central Control System components listed as optional in the specifications;
 - 3. All spare parts list as optional in the specifications;
 - 4. A three-year extension of the control system service plan through December 31, 2023.
- C. Bid Alternate 2 is to include installation of new irrigation for the practice range fairway (38 VIH sprinklers and associated pipe, wire, and fittings).

6.3 DRAWING PRECEDENCE

- A. The Contractor shall use all information in the Contract Documents and shall verify the information at the Project site prior to commencing work
- B. Design drawings must be used by the Contractor for installation of the system. Deviation from design drawings must be pre-approved in writing by Consultant to maintain the integrity of the design.

6.4 PRODUCT SUBSTITUTION

- A. The design of this irrigation system is based upon the operating characteristics of components which are listed specifically throughout this document and on the

drawings. They are listed as an acceptable product or as a basis for selection of a comparable product. Other products will be considered upon submittal of appropriate test and operation characteristics by the Contractor. Random substitution of similar products will render the design useless, may cause physical damage to the rest of the system, and may result in a potentially dangerous working environment. All specifications outlined herein must be addressed in order for the product to be considered. Alternative pipe sizes or wire sizes will not be considered in this proposal. Alternative system designs will not be considered. Alternative materials will be considered upon submittal of appropriate operating manuals, details and product specifications.

- B. Acceptance of alternative materials will be at the sole discretion of the Township and Consultant.

6.5 SUBMITTALS

- A. Within seven calendar days of the award of the contract, the Contractor shall submit to the Township and Consultant a digital copy of a materials list complete with manufacturers' names, and model numbers covering all material to be furnished under these specifications with digital copies of descriptive literature on all items listed on the material list. Items to be covered are as follows.
 - 1. HDPE pipe and fittings;
 - 2. PVC saddles;
 - 3. gate valves, air valves, drain valves, electric valves;
 - 4. valve boxes;
 - 5. sprinklers and quick couplers;
 - 6. central control, controllers, interface units, decoders;
 - 7. surge arrestors, grounding rods and plates;
 - 8. wire and connectors;
 - 9. weather station.
- B. All materials shall be those specified herein and approved by Consultant. Substitutions must be approved in writing by Consultant. No work shall be commenced prior to such approval.
- C. The Contractor shall furnish the Township with two individually bound manuals (and a digital file in pdf format) detailing operation and maintenance requirements for all components installed in the irrigation system. Each manual shall include the following items:

1. index sheet stating the Contractor's name, address, and telephone number;
 2. duration and calendar dates of warranty period;
 3. assignment of the manufacturer's warranties by the Contractor to the Township, as applicable;
 4. materials list including manufacturers' names, make and model numbers, name, address, and telephone number of manufacturers' representatives;
 5. spare parts list;
 6. detailed operation and maintenance instructions for all equipment.
- D. The Contractor shall furnish the Township and Consultant with a signed and dated check list prior to the final review of the work. The check list shall include the following items, each of which shall be fully detailed with names and dates:
1. permits;
 2. material list approvals;
 3. pressure and leakage tests if required;
 4. record drawings (as-built field notes);
 5. earth ground test results;
 6. operation and maintenance manuals;
 7. manufacturers' warranties;
 8. assignment of manufacturer's warranties to the Township, as applicable;
 9. Contractor's guarantees.
- E. The Contractor shall furnish the Township and Consultant with copies of all purchase orders and delivery tickets for items purchased for this Project.

6.6 GUARANTY - WARRANTY

- A. The Contractor warrants and guarantees that for a period of two (2) years from the date of final completion and acceptance of the Contractor's work hereunder, all work performed by it under this contract shall be free from any defects in workmanship and materials and agrees, at the Contractor's own expense, to repair and/or replace any defective work and materials and all other work damaged thereby which become defective during the term of the guaranty-warranty in an expeditious manner.
- B. The Township retains the right to make emergency repairs without relieving the Contractor's guaranty obligation. In the event the Contractor does not respond to the Township's request for repair work under this guaranty-warranty within a

period of forty-eight hours, the Township may make such repairs as the Township deems necessary at the full expense of the Contractor.

- C. Any settling of backfilled trenches that may occur during the guaranty-warranty period shall be repaired by the Contractor at no additional expense to the Township, including the complete restoration of all plantings, paving, or other improvements of any kind, damaged as a result thereof.
- D. The Contractor shall provide supervisory personnel for the first winterization following operation of the complete irrigation system, and for the start-up the following spring. The cost of labor and materials for repairs due to freezing or heaving shall be borne by the Contractor.

6.7 EXISTING UTILITIES

- A. The Contractor shall be responsible for verifying the location of all existing utilities above and below ground, including but not limited to conduits, gas lines, water and sewer lines, sprinkler lines, and electric, telephone and TV cables, etc. (all of which are herein collectively referred to as 'utility lines'), prior to commencing construction.
- B. The Township agrees, on request, to furnish the Contractor with all information it has, or from time to time may have, concerning the nature and location of said utility lines. It is specifically understood and agreed that the furnishing of such information by the Township shall in no way relieve the Contractor of the Contractor's responsibility for any damage occasioned to such utility lines by the Contractor's work, and the Contractor shall, at the Contractor's sole cost and expense, immediately repair any such damage to the condition it or they were in prior to said damage, to the satisfaction of the Township or owner of said utility lines.
- C. Installation of irrigation system components in utility easements is to be in accordance with requirements of the utility company.

6.8 COMPONENT LOCATING ON SITE

- A. Precise marking of the location of the components of the Irrigation System shall be the responsibility of the Township or Consultant.
- B. The Contractor shall furnish four (4) people to assist the Township or Consultant in staking the location of the components of the System.

- C. The Contractor shall mark the location of the components of the System using small marking flags, with different color flags for each type of sprinkler used on the Project. The Contractor shall have a ready supply of flags with eight different colors, one for each type of sprinkler, one for quick coupling valves, and one for isolation valves and other appurtenances.

6.9 INSPECTIONS

- A. The following inspections shall be made by the Township or Consultant during construction at the Township's or Consultant's request and in their presence.
 - 1. Pressure and leakage test of the piping system. Test to be conducted by the Contractor.
 - 2. Trench depth, change of depth, thrust blocking of pipelines.
 - 3. Finished grade of sprinklers and valve boxes.
 - 4. Restoration of grades upon completion of installation.
 - 5. Test of manual and automatic operation of all equipment.
- B. All tests and inspections must be passed satisfactorily before final acceptance of the system by the Township and Consultant.
- C. Some tests and inspections may be waived at the discretion of the Township. Waiver of tests and inspections shall be permitted only upon written notification by the Township.
- D. The Contractor shall remain responsible for all work and proper function of all system components whether tested, inspected, or not.

6.10 EXISTING IRRIGATION SYSTEM

- A. The Contractor is to ensure the Township has the ability to irrigate all areas of the golf course except the immediate area being installed at all times between April 1 and November 30.

6.11 ELECTRICAL

- A. The Contractor shall be responsible for all electrical permitting associated with the irrigation system installation.

6.12 RECORD DRAWINGS

- A. The Consultant shall be responsible for producing a record drawing ("as-built drawing") using sub meter accurate GPS data collection units.

- B. The Contractor is responsible for providing the Township and Consultant with accurate field notes upon which the GPS record drawing is based.
- C. Field notes are to include sprinkler model and location, valve type and locations, pipe routing and sizing, locations of major main line directional fittings, wire routing and sizing, wire splice locations, controller and grounding locations, and decoder addresses for each sprinkler and valve.
- D. The Consultant shall furnish the Contractor with copies of the design drawings for field work and for record keeping during construction. One set of prints shall be designated as a record set. One set of such drawings (kept current as provided in this section and the next subsection) shall be maintained at all times at the Project site and made available to the Township and Consultant upon request.
- E. Immediately upon installation of any piping, valves, wiring, splices, sprinklers, etc., in locations other than shown on the original drawings or of sizes other than indicated, the Contractor shall clearly indicate such changes on the record set of prints. Entries shall be made on a daily basis. All record prints shall be neat and subject to the approval of Consultant.
- F. The Contractor shall indicate on the field notes the location of all wire splices, original or due to repair, that are installed underground in a location other than next to a remote-control valve box or connection to a valve in head sprinkler.
- G. Golf course features are to be approximated on the field notes. Those features include greens, tees, fairways, bunkers, cart paths, buildings, streams, and ponds.
- H. The field notes shall also serve as work progress sheets. The Contractor shall make neat and legible notations thereon daily as the work proceeds, showing the work as actually installed. Field notes shall be available at all times for review and shall be kept in a location designated by the Township.
- I. Progress payment requests and as-built information must be approved in writing by the Consultant before payment is made.
- J. Field notes (not shown on the Contract drawings) shall be made available for review and inspection at all times during work hours by the Township, the Township's Representative and/or the Consultant.

- K. Before final inspection and approval, the Contractor shall deliver a complete set of field notes for all areas of the golf course to the Township and Consultant.

6.13 SCHEDULING

- A. The Contractor will commence work on or about October 28, 2019 and shall substantially complete the Project by March 2, 2020.
 - 1. Substantial completion requires that the irrigation system is functional as an automatic system from the central controller.
 - 2. The final inspection by the Township and Consultant, resulting in a punch list of items not satisfactorily complete, will be conducted no later than March 16, 2020.the
 - 3. The issues listed in the punch list must be resolved by contractor to the Township's satisfaction by March 30, 2020.
- B. Liquidated damages of \$300 per calendar day shall be assessed against the Contractor or deducted from any compensation due to the Contractor should Contractor fail to complete the work within the specified time; and if compensation due is less than the liquidated damages, the difference shall be payable by the Contractor to the Township upon demand.
- C. Supervision by the Township's representative of work that occurs during regular working hours, 7:00 AM - 5:00 PM, Monday - Friday, is the responsibility of the Contractor. Supervision of work occurring outside of those hours (weekends, holidays included) will have to be scheduled at least 24 hours in advance and the Contractor is responsible for additional costs incurred by the Township to provide a representative during those hours.
- D. Weather days are defined as those days during which the contractor is unable to work due to inclement weather or unsuitable working conditions such as frost, snow, or wet grounds. Weather days are to be monitored by the Township's representative and may be added to the substantial and final completion days at the completion of the Project.
- E. A work schedule showing the approximate dates that the various items of work will begin and end shall be submitted by the Contractor to the Township prior to commencing any work.

PART 7 - MATERIAL SPECIFICATIONS

7.1 PIPE AND FITTINGS

- A. Material Source and Quality: The Contractor shall use only new materials throughout. Use only those cleaners, solvents, primers, lubricants, and sealants specified herein and accepted and specified by the pipe and fitting manufacturers.
- B. HDPE Pipe: All pipe 1.5" and larger is to be iron pipe-sized (IPS) DR 13.5, PE 4710 high density polyethylene. Pipe is to be rated at 160 psi and is to be supplied in 40-foot lengths or larger spools. Pipe is to be manufactured by JM Eagle, Flying W Plastics or approved equal.
- C. HDPE Fittings:
1. HDPE Fittings shall be butt fusion or electrofusion made from dual rated 4710/3608 resin.
 2. Molded fittings and fittings made from machined billet/extruded stock (such as reducers or flange adapters) shall comply with ASTM D3261 shall be DR 11 if molded from 3408/3608 or 4710 resin.
 3. The ends of all DR 11 fittings are to be machined to DR 13.5 except where DR11 pipe is used.
 4. All butt fusion fittings are to be molded fittings unless otherwise approved.
 5. Fabricated fittings may be used only with prior approval of Consultant and only where molded fittings are not available.
 6. HDPE Wyes, Crosses, Blind Flanges are not permitted.
 7. Mechanical taps on 2" and 3" pipe for sprinklers and quick couplers shall be made using the LASCO 364 saddle tee with 1½ " acme threaded outlet, drilling the hole prior to installing the saddle.
 8. Mechanical taps on 1.5" pipe for pop-up rotors shall be made using the LASCO 362 saddle tee with 1" FNPT threaded outlet, drilling the hole prior to installing the saddle.
 9. Mechanical taps on 1.5" pipe for spray sprinklers shall be made using the LASCO 362 saddle tee with 1/2" FNPT threaded outlet, drilling the hole prior to installing the saddle.
- D. Swing Joint Assemblies: PVC swing joints shall be used on all sprinklers and quick coupling valves.
1. All valve-in-head swing joint bodies shall be 1.5".

2. Swing joints for all sprinklers with 1.5" inlets shall be 1.5" pre-manufactured unitized swing joint with 1.5" male ACME pipe thread at the bottom, 1.5" male ACME thread at the top, and 12" lay length.
 3. Swing joints for all sprinklers with 1.25" or smaller inlets shall be 1.5" pre-manufactured unitized swing joint with 1.5" male ACME pipe thread at the bottom, male ACME thread matching the sprinkler inlet at the top, and 12" lay length.
 4. Valve-in-head sprinkler swing joints shall be manufactured by Rain Bird, Toro or Lasco.
 5. Swing joints for pop-up sprinklers are to be 1" pre-manufactured units with 1" male pipe thread at the inlet and 1" male ACME thread at the outlet, and 12" lay length.
 6. Swing joints for spray heads are to field fabricated using two ½" spiral barbed elbows and a 1-foot length of ½" swing pipe
 7. Swing joints for quick couplers shall be a 1" unit with 1.5" male ACME pipe thread at the bottom, 1" brass male pipe thread at top, and 18" lay length. Swing joint shall include a 1" snap lock fitting to prevent quick coupler from rotating off of the swing joint when key is inserted or removed. Swing joint is to be model G1MS-218 as manufactured by Lasco.
- E. Air Release Valve Mount: Valve shall be connected to pipe with an assembly of 1" brass pipe and fittings. A 1" iron wye strainer shall be incorporated into the riser assembly.

7.2 SPRINKLERS

- A. Valve-in-Head Sprinklers
1. Sprinklers shall be as indicated on the drawing legend.
 2. Valve-in head sprinklers are to have pressure regulation modules factory set at 70 or 80 psi according to drawing legend.
 3. All sprinklers are to have female ACME threads.
 4. Sprinklers are to include Rain Bird IC module or Toro smart module.
- B. Pop-up Sprinklers
1. Pop-up sprinklers shall be as indicated on the drawing legend.
 2. Sprinklers are to have 1" female ACME inlet at base.
- C. Spray Heads

1. Spray head bodies for landscape/turf beds around clubhouse are to be 6" fixed spray pop-ups.
 2. Spray heads are to have 1/2" FNPT inlet at base.
 3. Spray heads are to include a 45 psi in-stem pressure regulator and a Seal-A-Matic check valve.
 4. Spray heads are to be Rain Bird model RD-06-S-P45-F, no equal.
- D. Spray Head Nozzles
1. Spray head nozzles are to be Hunter MP1000 or MP2000, depending on spacing.
 2. Nozzle inlet must match threads on spray head body.

7.3 VALVES

- A. Ductile Iron Manual Valves:
1. All mainline isolation valves 3" and larger shall be AWWA standard cast iron body with epoxy coating inside and out. The valve shall have resilient seat wedge and a 2" square operating nut.
 2. All units are to be flanged.
 3. Valves shall be as manufactured by Leemco or approved equal.
- B. Lateral Isolation Valves:
1. Except where shown on the plans, valves connecting mainline to laterals shall be 2" or 3" stainless steel swivel valves with 2" square operating nut, stainless steel grip ring, and 6" rise above the mainline.
 2. Use 3" valves unless otherwise noted on the plan.
 3. Valves are to be 841 series as manufactured by Harrington Corporation.
- C. Stainless Steel, Threaded, Manual Gate Valves: Where indicated on the drawings, drain valves and isolation valves on remote control valve zones shall be 1.5" Stainless steel FNPT gate valves with tee handle, Leemco model LGT-1515SS-304X.
- D. Combination Air Valves: The valve shall be a Crispin Irrigation Combination Air Release Valve, model IC10, having a 1-inch FNPT inlet and outlet with a 3/32-inch pressure air release orifice, and shall be rated for pressures up to 150 psig. The valve shall have a cast iron body, stainless steel internal components, a stainless-steel float, and a Buna-N seat.

- E. Valve Boxes: Valve boxes are to be high impact plastic as manufactured by Carson, Toro, Rain Bird, or approved equal. 'Economy' grade boxes are not acceptable.
- F. Quick Coupling Valves: Valve is to be a 1" unit constructed of solid red brass with 1" FNPT inlet threads and female ACME inlet threads. Valve is to be Buckner model QB44RCAT10, no equal.
- G. Electric Remote-Control Valves: Remote control valves are to be 1" or 1.5" plastic, pressure regulating, scrubber units rated at 200 psi operating pressure. Valves are to be Toro P220GS-27-0x-DL or Rain Bird PESB-PRSD-IC series.

7.4 CONTROL SYSTEM

- A. The central control system is to be a computer-based program that communicates to Toro Smart Hubs or Rain Bird IC Interface units, which communicate programming commands to sprinklers and valves via a communication wire path.
- B. Central Control System is to be:
 - 1. Toro Lynx CE, or:
 - 2. Rain Bird Stratus II
- C. Additional central control system features/accessories are to include:
 - 1. New field interface unit – Toro FIU wireless or Rain Bird IC Interface;
 - 2. One-year service plan (Toro NSN or Rain Bird GSP). Service plan is to extend through December 31, 2020.
 - 3. New desktop computer, monitor, keyboard in accordance with manufacturer's recommendations;
 - 4. Mobile access to central from operator's cell phone or tablet;
 - 5. Toro Lynx mobile apps or Rain Bird MI.
 - 6. Uninterruptible power supply;
 - 7. All antennae, radios, surge arrestors, and accessory items needed to communicate to field controllers/interface units, weather stations, or other system components.
- D. Optional components to be included as part of the spare parts and weather station Bid Alternate include:
 - 1. Two Apple iPad mini 3 tablets;
 - 2. Two impact-resistant, waterproof cases for iPad mini 3;

3. Vizio model E43-C2 43" wall-mount flat screen Smart LED TV; and
 4. Wireless All-in-One color printer. Epson Workforce WF-3640 or approved equal; and
- E. Field Controllers
1. Toro
 - a. Toro controllers are to be Toro Smart Hub units that communicate programming signals to decoders via a two-wire communication path.
 - b. Communication from the central control interface to the Smart Hubs is to via radio.
 - c. Controllers are to be Toro model DEC-RSP-1000-DR.
 2. Rain Bird
 - a. Rain Bird control system will include one IC Interface unit installed at the central control system location (inside) which will deliver programming commands to the front nine and a remote IC Interface unit which will deliver programming commands to sprinklers and valves on the back nine.
- F. Weather Station (Bid Alternate)
1. Weather station is to be a solar-powered unit that communicates to the central control computer via 916 MHz spread spectrum radio.
 2. Weather station is to log the following information and report it back to the central control computer:
 - a. Wind speed;
 - b. Wind direction;
 - c. Air temperature;
 - d. Relative humidity;
 - e. Rainfall;
 - f. Solar radiation; and
 - g. Barometric pressure.
 3. Weather station is to be programmed according to central control manufacturer's requirements.
 4. Weather station is to be Toro model TTW916-B-SP or Rain Bird WSPRO-LT916-B-SP.

7.5 WIRING

- A. Irrigation Power Wire: All power cables are type TC (tray cable) or UF (underground feeder), UL listed for direct burial, with insulation rated for 600 volts AC. Single phase power cable shall include three conductors, colored per wire industry standard or numbered as 1, 2, and 3. The size of the ground conductor is to be according to National Electrical Code, or larger.
- B. Underground Utility Tape: Underground utility warning tape shall be used to indicate all underground irrigation power and communication wire (along trunk line only). Traceable tape is not required but may be used.
- C. Decoder Cable:
 - 1. Toro - Decoder cable installed between the Smart Hub units and sprinklers is to be #14 AWG, two conductor, solid copper type PE twisted. Use different color combinations for each wire path. Wire shall be Paige Electric model P7389D or approved equal.
 - 2. Rain Bird – The communication wire installed between the Rain Bird IC Interface units and sprinklers/valves is to be two conductor Paige Electric Corporation type P7072D-6 MAXI Wire, #14 AWG, or approved equal. Use different color wires for each Rain Bird wire path (four total).
- D. Tracer Wire: The tracer wire installed with all piping downstream of remote-control valves shall be copper type PE irrigation control wire. All station wire shall be 14 AWG in size and shall be blue in color. Wires shall be Paige model P7079D or approved equal.
- E. Wire Splices
 - 1. Splice no more than three communication conductors in one 3M Corporation model DBR/Y-6 direct burial splice kit.
 - 2. Splice no more than two power conductors in one 3M DBR/Y-6 direct burial splice kit.
 - 3. Splice four or more communication conductors in one Paige Electric model DB14-4 direct burial splice kit.
- F. Surge Suppression Equipment:
 - 1. Install Toro DEC-SG-Line or Rain Bird ICSD surge arrestors at the locations shown on the plan in accordance with the installation details.

2. Provide surge protection at each Smart Hub, IC Interface Unit and central control installation in accordance with manufacturer's recommendations.

7.6 TOOLS AND SPARE PARTS (BASE BID)

- A. Sprinkler Tools: The Contractor shall supply the following tools in the stated quantity for operation and servicing of the sprinklers.
 1. six (6) selector valve keys;
 2. four (4) long-handled selector valve keys;
 3. four (4) complete sets of tools for servicing all sprinkler models specified.
- B. Valve Tools: The Contractor shall supply the following tools and components to be used with the various valves on the Project.
 1. three (3) 4 ft long operating keys for the 2" square nuts on the isolation valves;
 2. four (4) quick coupler valve keys matching the specified quick coupler;
 3. four (4) 3/4" hose swivel for top of valve key.

7.7 TOOLS AND SPARE PARTS (BID ALTERNATE)

- A. Sprinklers: Supply complete sprinklers in addition to those installed on the Project as follows:
 1. four (4) 60-foot full circle VIH sprinkler;
 2. four (4) 60-foot part circle VIH sprinkler;
 3. four (4) 75-foot full circle VIH sprinkler;
 4. two (2) 75-foot part circle VIH sprinkler;
 5. two (2) pop-up rotors;
 6. six (6) spray heads and nozzles;
 7. two (2) quick coupling valves;
- B. Electrical Parts/Tools:
 1. Ten (10) Toro smart modules or Rain Bird IC modules;
 2. Six (6) surge arrestors;
 3. 100 DBR/Y-6 splice kits (singles).
 4. 20 Paige DB14-4 splice kits.
- C. Toro control system:
 1. one (1) Smart Hub timing mechanism;
 2. one (1) Smart Hub modem;
 3. one (1) Smart Hub radio;

4. one (1) Smart Hub radio interface kit;
5. one (1) Smart Hub motherboard;
6. one (1) Smart Hub daughterboard.

D. Rain Bird Interface:

1. one (1) ICI CPU board;
2. one (1) ICI driver (output) board;
3. one (1) ICI power transformer.

E. Miscellaneous:

1. Three (3) Philmac 3" HDPE compression repair coupling
2. Four (4) Philmac 2" HDPE compression repair coupling;
3. Four (4) Philmac 1.5" HDPE compression repair coupling.

PART 8 - INSTALLATION SPECIFICATIONS

8.1 PIPE AND FITTINGS

A. Pipe Sizes

The Contractor will follow pipe sizing as shown on the drawings. Changes in size and points of interconnections must be approved in writing by Consultant. Improper changes in size and points of interconnections may result in poor system performance.

B. HDPE Pipe

1. Install HDPE pipe as shown in accordance with manufacturer's recommendations. Contractor personnel joining pipe must be certified by the manufacturer in the installation of high-density polyethylene pipe, including butt fusion, electrofusion, and saddle installation. If Contractor personnel is not certified in HDPE installation and fusion techniques, the Contractor shall employ a subcontractor or manufacturer's representative to train the Contractor's crew on the installation of HDPE pipe.
2. Hauling, Unloading, and Distributing Pipe: During loading, transportation and unloading, every precaution shall be taken to prevent injury to the pipe. No pipe shall be dropped from cars or trucks or allowed to roll down slides without proper retaining ropes. During transportation each pipe shall rest on suitable pads, strips, skids or blocks securely wedged or tied in place. Any pipe damaged shall be replaced.
3. Fusion: Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe supplier's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe supplier, including, but not limited to, temperature requirements of 400 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The fusion equipment used shall be manufactured by McElroy Manufacturing, or equal. The butt fusion joining must produce a joint weld strength equal to or greater than the tensile strength of the pipe itself.
4. Electrofusion may be used where the butt fusion method cannot be used. Electrofusion couplings and fittings shall be PE3408/3608 HDPE, Cell Classification of PE 345464C as determined by D3350-05. Electrofusion

couplings or fittings shall have a manufacturing standard of F1055.

Couplings and fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans.

5. Mechanical connection to other types of pipe shall be made by one of the following methods:
 - a. Flange, using HDPE flange adapter with ductile iron back up ring, and ISCO zinc-plated bolt pack.
 - b. Mechanical joint, using HDPE Mechanical Joint (MJ) adapter kit.
 - c. ISCO bell MJ adapter with kit (4"- 12").
 - d. Threaded connection; Brass male threaded x HDPE transition fitting.
 - e. Ductile iron fitting, valve, or coupling using a stainless-steel insert in the HDPE pipe and a joint restraint.

C. Threaded Fittings

1. All NPT threaded fittings shall be made using Teflon tape.
2. Plastic threaded fittings shall be made using mild wrench pressure.
3. Metal pipe threaded fittings as at the air release valves shall be made using Teflon tape and moderate wrench pressure.
4. ACME fittings are to be assembled by hand. Turn the threaded parts onto each other until the parts can no longer be turned. Back off the fittings by one half to one full turn.

D. Trench Installation

1. All mainline pipe 3" and larger is to be installed using open trench installation techniques unless otherwise noted.
2. Mainline pipe, 4" and larger, shall have a minimum of 24" of cover. Lateral pipes, 3" and smaller, shall have a minimum of 18" of cover.
3. Depth changes shall be accomplished by sloping the pipe or by using 45-degree fittings.
4. The minimum trench width for pipe sized three inches (3") or less shall be six inches (6"). Provide at least four inches (4") of space on each side of any pipe larger than three inches (3").
5. Blocking should not be used to change pipe grade or to intermittently support pipe across excavated sections. Pipelines shall be graded down to drain valves. Do not lay pipe so that local 'low spots' occur that will not

allow the water to drain and introduce possible freeze damage in the winter.

6. Pipe shall be laid in open trenches so that it snakes back and forth through the trench to allow for expansion and contraction.
7. At the end of each workday, the Contractor shall cover the open end of the pipe so as to prevent silt, debris, or small animals from entering the pipe. Open ends shall be covered with a ten (10) mil plastic held securely in place with tape.
8. The Contractor is responsible for disposal of uncovered rock and debris resulting from the Contractor's work.

E. Plowed Pipe Installation

1. The Contractor may at his discretion and with the Township Representative's consent install HDPE pipe 2" and smaller using a vibratory plow technique.
2. All areas in which pipe is to be installed using the vibratory plow technique must be approved by the Township's Representative prior to commencement of work.
3. The Contractor is responsible for excavating sprinkler locations prior to plowing to demonstrate that soil conditions are suitable.
4. The Contractor is to follow manufacturer's recommendations in determining the appropriate time for allowing fused joints to set based on weather conditions.
5. Plow lines are to be restored to existing grade by rolling or mechanically tamping disturbed areas.

F. Stream Crossings

1. Pipe crossing streams is to be installed in accordance with the installation details and local requirements.
2. Pipe is to be installed using directional boring equipment.
3. Pipe and wire are to be installed at least 24" below the bottom of the stream.
4. The Contractor is to provide one 2" HDPE wire sleeve alongside the pipe at each stream crossing.

G. Gas Easement Crossings

1. The Contractor is to arrange for gas line easement to be marked by gas company throughout the property prior to excavation.
2. Do not install any sprinklers or valves within the easement.
3. Install pipe crossing easement perpendicular to the gas easement.
4. Install any wire in conduit within the easement.
5. The Contractor is to maintain minimum clearances between irrigation pipe and gas line throughout the easement in accordance with gas company's requirements.

H. Deleterious Material:

Deleterious material shall be dug and hauled to an accessible on-site location designated by the Township. Determination of deleterious material shall be made jointly by the Township and the Contractor. The Township shall provide suitable backfill on site. The Contractor shall install suitable replacement backfill as needed. Cost of labor to transport and install backfill from a location on site shall be included in the unit price for deleterious material provided with the bid.

I. Extraordinary Excavation:

1. The Contractor is to propose the use of rock hammers, rock saws, or excavators larger than standard (18,000 to 20,000 lbs.) when conditions dictate. Additional costs for such machinery and techniques will be negotiated on a case by case basis. Compensation for materials removed by use of these techniques shall be according to the Deleterious Material unit price.
2. The Contractor shall propose blasting by professional licensed personnel when conditions dictate. Compensation for blasting shall be negotiated on a case by case basis and shall include imported backfill. The Deleterious Material unit price shall not apply to blasting work.

J. Bedding:

1. The bottom of the trench is to be graded to a line so that the pipe, as nearly as possible, will have bearing for its full length.
2. The trench bottom shall be smooth and free from any stones greater than ½" diameter, dirt clods greater than 2" diameter, and any frozen material.
3. All rock and organic material shall be removed from the trench bottom prior to placing of pipe.

4. Provide a layer of loose, clean earth to provide proper bearing. Hand excavate for bells and fittings if the loose fill is inadequate to properly support the barrel without placing excess load on the bells or fittings.
5. If rock is encountered in the excavation, the trench must be excavated to a depth of six inches (6") below pipe grade and filled with well-compacted earth to pipe grade. There will be at least six inches (6") of earth between the bottom or sides of the pipe and any rock.
6. If unstable bedding material is encountered, it shall be removed and replaced with suitable material.

K. Backfill

1. The initial backfill in contact with the pipe and immediately surrounding it shall be of fine-grained material free from rocks, stones, or clods greater than approximately 1/2" diameter and earth clods greater than approximately 2" diameter. The back-fill shall be tamped in layers not to exceed 6" lift and compacted firmly around the pipe and up to at least 6" above the top of the pipe. Backfill shall be compacted to 95% standard proctor density. The back-fill material shall be sufficiently damp to permit thorough compaction under and on each side of the pipe to provide support, free from voids. Care shall be taken to avoid deforming, displacing, or damaging the pipe during this phase of the operation.
2. The final back-fill shall be placed and spread in approximately uniform layers in such a manner as to fill the trench completely so that there will be no unfilled spaces under or around rocks or lumps of earth in the back-fill. Final back-fill shall be free of large rocks, frozen clods and other debris greater than 3" in diameter. Final back-fill shall be mechanically tamped to 95% standard proctor density and finished with a grade that permits proper restoration, whether using sod or seed with mulch. Mounding of final back-fill in anticipation of natural settling is not acceptable.

L. Cart Paths

1. Mainline pipes (3" and larger) are to be installed under cart paths using an open cut.
2. Lateral pipes and wires (2" and smaller) are to be installed under cart paths using directional boring equipment.
3. Cart paths are to be saw cut prior to excavation.

4. Final backfill will be crusher run, compacted to 95% Proctor density or higher, with final elevation to match existing sub-grade under adjacent cart path.
 5. Cart paths are to be repaved to match conditions prior to excavation.
- M. Restoration.
1. Trench lines will be restored as discussed previously. Earth is not to be mounded over the trenches.
 2. The Contractor is to remove and replace sod over all trench lines.
- N. Flushing and Testing
1. Every effort must be made to prevent soil, sand, and other construction debris from entering the pipe. Mainline pipes must be thoroughly flushed with water prior to opening lateral isolation valves. Lateral pipes must be flushed with water vented through drains or sprinklers with the internal components removed. The Contractor is responsible for the effects of construction debris in the pipelines on the irrigation equipment.
 2. If requested to do so by the Township or Consultant, the Contractor is responsible for pressure and leak testing the pipe network in accordance with industry standards. Consultant must be notified 24 hours in advance of a test. Tests may be applied to individual sections of the pipe network.
 3. Test is to be conducted with pipe filled with water and all air expelled.
 4. Test is to be conducted in accordance with industry standards.

8.2 SPRINKLERS

- A. Spacing of valve-in-head sprinklers shall be as described in the drawing legend.
- B. Sprinklers shall be placed around greens in such a way so as to ensure that every point of the green will receive water from at least two sprinklers.
- C. Sprinkler placement shall be flagged beginning at the green and working towards the tee. Transition from one sprinkler type to another shall be based upon the larger of the two radii, e.g. the first set of 70 ft sprinklers in a fairway shall be located 70 ft from the 60 ft approach sprinklers.
- D. Set all sprinkler heads perpendicular to finished grades with the top of the sprinkler at finished grade.
- E. Connect sprinklers to communication wire path. Leave at least 24 inches of wire slack at each sprinkler, valve, or surge arrestor.

- F. The Contractor is responsible for adjusting all part circle sprinkler coverage arcs in accordance with the Township's or Consultant's instructions.
- G. The Contractor is to carefully record the decoder/IC address for each sprinkler or electric valve. The Contractor is to clearly mark the station ID on the field notes and irrigation record drawing.

8.3 VALVES

- A. All manual isolation valves shall be installed below a 10" round valve box with 6" or 8" sleeving. Install greens isolation valves within 30 feet of the greens collar. Greens isolation valve location must be approved by the Township or Consultant prior to installation. Greens isolation valves are not to be installed in front of greens unless flagged there by the Township or Consultant.
- B. Connect lateral isolation valves to mainline in accordance with installation details and specification. All lateral isolation valves shall be installed below 10" round valve boxes with 6" or 8" sleeving.
- C. Install drain valve assemblies at low points on the main and lateral pipelines in quantities as shown on the drawing. Service tee for drain valve shall be oriented so that the pipeline can be fully emptied of water. Drain pipe line shall slope down and extend to 'daylight'. Drain valves shall be located below 10" round valve boxes with sleeving.
- D. Install combination air valves at high points in the pipelines in quantities as indicated on the drawing. The combination air valves shall be installed in accordance with the installation detail.
- E. Install quick couplers in accordance with the installation details. Install quick couplers in a valve box and locate next to a sprinkler or valve unless otherwise instructed by the Township or Consultant.
- F. Install electric valves in standard rectangular valve boxes in accordance with the installation details. Adjust pressure regulation modules to 60 psi unless otherwise noted.

8.4 VALVE BOXES

- A. Install valve boxes in accordance with the installation details, with the top flush with finished grade unless otherwise noted.
- B. Use black lids on valve boxes covering wire splices.

8.5 CONTROL SYSTEM

A. Central Control System

1. Arrange for a site survey of local radio frequencies by the manufacturer's representative prior to ordering irrigation control system components.
2. Secure FCC licensing for the central control system as required.
3. Install all central control system equipment at the maintenance facility.
4. Install a ground grid adjacent to the building where the central control computer is installed.
5. Install the computer monitor on the wall near the central control computer and provide all cable connections between the computer and TV screen.
6. Provide programming sheets showing sprinkler type, location, and nozzle size associated with each station. Provide field sketches of irrigation on each hole with decoder numbers listed next to each sprinkler.
7. Coordinate programming of the central control system by the Consultant.
8. Install as-built drawing into central control system program.

B. Toro Smart Hub Units

1. Install Smart Hub units on the golf course close to the locations shown on the drawings. The exact location of each Smart Hub will be approved by the Township's Representative.
2. Mount the pedestal on a reinforced concrete pad as shown in the detail drawing. The concrete pad will extend a minimum of six inches (6") below finished grade and two inches (2") above finished grade. The edges of the concrete pad shall extend a minimum of six inches (6") from the pedestal, with the surface sloped on all sides for proper drainage. Wires from the field will enter the satellite via PVC conduit sweeps that penetrate the concrete base.
3. Install power wire in 1" sweep elbow and ground wire into 1.5" sweep elbow. Install decoder cables into 2" sweep elbow.
4. Install ground field in accordance with installation details.
5. The Contractor is to connect to existing power wire at each Smart Hub location. The Contractor is to locate and mark power wire from source to Smart Hub location.

C. Rain Bird IC Interface Units

1. Install IC Interface units on the golf course close to the locations shown on the drawings.
 - a. Install one unit inside the maintenance facility at the central control system computer location.
 2. Wire each IC Interface to a dedicated circuit breaker in the building.
 3. Install all antennae, radios, and surge arrestors at each location in accordance with the installation details.
 4. Install ground field in accordance with installation details.
- D. Weather Station (Bid Alternate)
1. Install weather station in accordance with manufacturer's recommendations at a location approved by the Township and Consultant.
 2. Mount weather station on a 1.5" diameter by 10-foot long galvanized steel pole. At least 2 feet of the pole is to be installed below grade, anchored in a 6" diameter by 3-foot concrete Sonotube.
 3. Install radio and antenna at the central control computer and ensure the weather station communicates to the central control computer.

8.6 WIRING

- A. Irrigation Power Cable (if applicable)
1. Connect each power cable to the designated power source using an individual 15-amp, 120 VAC circuit breaker. The neutral wire is not to be connected to ground anywhere except at the power source.
 2. Install power cable with a minimum cover of 24" at all locations.
 3. Splice power cable in correctly sized splice kits designed specifically for direct buried power cables. **Cover every power cable splice with a valve box.**
 4. Install all above ground power wiring in UL listed PVC conduit and connectors in accordance with local codes.
 5. Install cables in pipe trenches wherever possible.
 6. Provide an expansion coil of approximately 9' of cable at each change in direction along the wire path where the cable is directly buried in a trench, and at each side of a road crossing. Provide an expansion coil of approximately 5' of cable every 1000' of straight cable run. Expansion coil is to be 24" to 30" in diameter, will not be taped nor restrained in any way, and will be laid flat in the trench.

- B. Install underground utility warning tape over the center of the power and decoder cables twelve inches (12") below the finished grade of the trenches.
- C. Decoder Cable
1. Install cable in pipe trenches where possible.
 2. Provide an expansion coil of approximately nine (9) feet of wire at each change in direction along the wire path where the wire is direct buried in a trench, and at each side of a road crossing. Provide an expansion coil of approximately five (5) feet of wire every 1000' of straight wire run. Expansion coil is to be 24" to 30" in diameter, will not be taped nor restrained in any way, and will be laid flat in the trench.
 3. Splice the communication cable in accordance with the control system manufacturer's recommendations. Avoid field splicing of the control wire. Cover every splice in the control wire with a valve box. Clearly mark the locations of the splices on the record drawing. Permanently label the origin and destination of every wire leg at every intersection of three or more control cables using permanent wire label kits.
 4. Maintain a uniform and unique color for each wire path throughout the length of the wire path, regardless of the size or length of wire run. Indicate the colors on the field sketches and as-built drawings for easy identification in future. Do not splice different wire paths together.
 5. Connect sprinklers to the wire path indicated on the design drawings. Do not change wire path for sprinklers or valves without prior approval of the Consultant.
 6. Do not exceed wire path limits in the notes on the irrigation plans.
 7. Communication wire to fairway sprinklers is always to enter the fairway from the green end unless otherwise noted with three or four-way wire splices located at the fairway isolation valve closest to the green.
 8. Install above-ground communication wire in conduit.
 9. Install surge arrestors at the locations shown on the plan in 10" round valve boxes. Mark wires entering and exiting surge arrestors at fairway feeds, identifying incoming (closer to central) and outgoing (farther from central).
 10. Provide expansion coils of at least 3 feet at every sprinkler and surge arrestor.

8.7 GROUNDING

- A. Central, Smart Hub, and Remote IC Interface Ground Field
 - 1. Install a ground field at each SmartHub/IC Interface location and the central control location. Refer to the construction detail drawing.
 - 2. Each rod is to be driven into the ground in a vertical position, or at an angle not to exceed 45 degrees from vertical, at a location ten to twelve feet from the electrical equipment or the wires and cables that the rod is protecting. Terminate ground rod cable at the controller ground lug.
 - 3. The ground plate wire is to be terminated at the controller ground lug. The ground plate shall be installed at a minimum depth of 36", at a location 15 to 20 feet from the ground rod.
 - 4. Spread the earth contact enhancement material so that it surrounds the copper plate evenly along its length within a 6" wide trench.
 - 5. All electrodes shall be installed in an area devoid of buried power, communication, or station wires.
 - 6. Spacing between electrodes (plate or rod) shall be no less than 16 ft.
 - 7. Install ground wire with a minimum of bends. All necessary bends shall be accomplished with a broad sweep, and the included angle may never be less than 90 degrees.
 - 8. Cover the ground rod 6" round valve box for future inspection.
- B. Surge Device Grounding
 - 1. Connect each surge arrester to a 4" x 36" copper plate in accordance with the installation details.
 - 2. Earth contact enhancement material shall be spread so that it surrounds the copper plate evenly along its length within a 6" wide trench.
- C. Measure, record, and report to the Consultant and Township's Representative the earth-to-ground resistance at each ground field using a megohm meter. The goal is to have a resistance of less than 10 ohms at the central control location, Smart Hub locations and less than 45 ohms at the surge arrestors placed along the decoder cable.
- D. Additional plates, rods and ground enhancement material may be installed if directed to do so by the Township's Representative. Additional grounding will be considered extra services.

8.8 CLUBHOUSE IRRIGATION

- A. The Contractor is to provide and install irrigation for two landscape/turf areas near the clubhouse as noted on the irrigation plan.
- B. Scope of work is to include installation of the following:
 - 1. two 1" electric valves (shown on plan) including isolation valve and valve box per detail;
 - 2. forty (40) 6" spray heads with nozzles on risers made from spiral-barbed fittings and ½" swing pipe;
 - 3. 1.5" HDPE lateral pipe and all associated fittings including Lasco saddles under each spray head;
 - 4. #14 AWG tracer wire with all lateral pipe.

8.9 DEMOLITION

- A. Existing Irrigation Equipment –
 - 1. Six (6) existing irrigation controllers and controller pads are to be removed by the Contractor. Controllers are to be turned over to the Township upon removal.
 - 2. The Contractor is to disconnect controller power wire that extends beyond new Smart Hub locations. Only power wire between source and Smart Hubs is to remain in place. Place any splices in power wire in 10" round valve box with black lid.
 - 3. Existing irrigation system sprinklers and valves are to be removed by golf course personnel.

APPENDIX A
WARMINSTER TOWNSHIP CODE
CHAPTER 4 [BUILDINGS], PART 1 [RESPONSIBLE BUILDING CONTRACTORS]

Chapter 4. Buildings

Part 1. Responsible Building Contractors

[1] *Editor's Note: Original Part 1 of Ch. 4, Numbering of Buildings, adopted by Ord. 279, 2/3/1975, as amended; and original Part 2 of Ch. 4, Dangerous Structures, adopted by Ord. 578, 6/13/2002, were repealed by Ord. 737, 1/19/2017.*

§ 4-101. Responsible contractor requirements.

[Ord. 729, 5/5/2016^[1]]

1. All contractors and subcontractors of any tier that perform work valued at over \$350,000 on any public facility or public works project, including construction, demolition, alteration, renovation, repair and contract service or contract maintenance work, shall meet the requirements of this Part 1.
2. All firms engaged in contracts covered by this Part 1 shall be qualified, responsible contractors or subcontractors that have sufficient capabilities in all respects to successfully perform contracts on which they are engaged, including the necessary experience, equipment, technical skills and qualifications and organizational, financial and personnel resources. Firms bidding on public contracts shall also be required to have a satisfactory past performance record and a satisfactory record of law compliance, integrity and business ethics.

[1] *Editor's Note: Ordinance No. 729 repealed Ord. No. 680, 1/15/2009, Responsible Building Contractors, which was previously codified in Ch. 5, Code Enforcement, Part 3; it was relocated to Ch. 4, Part 1, at the request of the Township.*

§ 4-102. Contractor responsibility certifications.

[Ord 729, 5/5/2016]

1. As a condition of performing work on a public works contract subject to this Part 1, a general contractor, construction manager or other lead or prime contractor seeking award of a contract shall submit a contractor responsibility certification at the time it submits its bid for a contract.
2. The contractor responsibility certification shall be completed on a form provided by the Township and shall reference the project for which a bid is being submitted by name and contract or project number.
3. In the contractor responsibility certification the construction manager, general contractor or other lead or prime contractor shall confirm the following facts regarding its past performance and work history and its current qualifications and performance capabilities:
 - A. The firm and its employees have all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, including, but not limited to, licenses, registrations or certificates required to: (a) do business in the designated locale; and (b) perform the contract work it seeks to perform. These shall include, but not limited to, licenses, registrations or certificates for any type of construction or maintenance trade work or specialty work which the firm proposes to self-perform.
 - B. The firm meets the bonding requirements for the contract, as required by applicable law or contract specifications and any insurance requirements, as required by applicable law or contract specifications, including general liability insurance, workers' compensation insurance and unemployment insurance.
 - C. The firm has not been debarred or suspended by any federal, state or local government agency or authority in the past three years.

- D. The firm has not defaulted on any project in the past three years.
 - E. The firm has not has any type of business, contracting or trade license, registration, or other certification revoked or suspended in the past three years.
 - F. The firm and its owners have not been convicted of any crime relating to the contracting business in the past 10 years.
 - G. The firm has not within the past three years been found in violation of any law applicable to its contracting business, including, but not limited to, licensing laws, tax laws, prompt payment laws, wage and hour laws, prevailing wage laws, environmental laws or others, where the result of such violation was the payment of a fine, back pay damages or any other type of penalty in the amount of \$1,000 or more.
 - H. The firm will pay all craft employees that it employs on the project the current wage rates and fringe benefits as required under applicable federal, state or local wage laws.
 - I. All craft labor that will be employed by the firm for the project have completed at least the OSHA ten-hour training course for safety established by the United States Department of Labor, Occupational Safety and Health Administration.
 - J. The firm will employ craft employees in all classifications and individual trades required to successfully perform the work related to this project.
 - K. The firm participates in a Class A apprenticeship program for the past three years, at a minimum, for each separate trade or classification in which it employs craft employees and shall continue to participate in such program or programs for the duration of the project.
 - (1) For purposes of this section, a "Class A apprenticeship program" is an apprenticeship program that is currently registered with and approved by the United States Department of Labor or a state apprenticeship agency and has graduated apprentices to journeyperson status for at least three of the past five years.
 - (2) To demonstrate compliance with this section, the firm shall provide, with this certification, a list of all trades or classifications of craft employees it will employ on the project and documentation verifying it participates in a Class A apprenticeship program for each trade or classification listed.
 - L. The firm has all other technical qualifications and resources, including equipment, personnel and financial resources, to perform the referenced contract, or will obtain same through the use of qualified, responsible subcontractors.
 - M. The firm will maintain all qualifications, resources and capabilities referenced in this certification throughout the duration of the project.
 - N. The firm shall notify the Township within seven days of any material changes to all matters attested to in this certification.
 - O. The firm understands that the contractor responsibility certification required by this section shall be executed by a person who has sufficient knowledge to address all matters in the certification and shall include an attestation stating, under the penalty of perjury, that the information submitted is true, complete and accurate.
- 4. Execution of the contractor responsibility certification required by this Part 1 shall not establish a presumption of contractor responsibility, and the Township may require any additional information it deems necessary to evaluate a firm's status as a responsible contractor, including technical qualifications, financial capacity or other resources and performance capabilities. The Township may require that such information be included in a separate statement of qualifications and experience or as an attachment to the contractor responsibility certification.
 - 5. The submitting firm shall stipulate in the contractor responsibility certification that, if it receives a notice of intent to award contract, it will provide a subcontractor list and required subcontractor information as specified in § **4-105** of this Part 1.
 - 6. If the submitting firm has ever operated under another name or controls, is controlled by another company or business entity or in the past five years controlled or was controlled by another company or business entity, whether as a parent company, subsidiary or in any other business relation, it shall attach a separate statement to

its contractor responsibility certification that explains in detail the nature of any such relationship. Additional information may be required from such an entity if the relationship in question could potentially impact contract performance.

7. If a firm fails to provide a contractor responsibility certification required by this section, it shall be disqualified from bidding. No action of any nature shall lie against the Township because of its refusal to accept a bid for failing to provide information required by this section.

§ 4-103. Notice of intent to award contract.

[Ord 729, 5/5/2016]

1. After it has received bids for a project, the Township shall issue a notice of intent to award contract to the firm offering the lowest responsive bid.
2. Such notice shall be issued immediately or as soon as practicable after bids are opened and after the Board of Supervisors shall vote to authorize issuance of a notice to the apparent low bidder. The notice shall stipulate that the contract award is conditioned on the issuance of a written contractor responsibility determination, as required by § 4-105 and any other conditions determined appropriate by the Township.

§ 4-104. Subcontractor lists; subcontractor responsibility certifications.

[Ord 729, 5/5/2016]

1. Within five days from the date of notice of intent to award contract, a prospective awardee shall submit to the Township a subcontractor list containing the names of any subcontractors that will be used for the referenced project, their addresses and a description of the work each listed subcontractor will perform on the project.
2. At the time a prospective awardee submits the subcontractor list it shall also submit subcontractor responsibility certifications for all listed subcontractors to the Township. Subcontractor responsibility certifications shall be executed by the respective subcontractors on forms prepared by the Township and shall contain the same information and representations required in contractor responsibility certifications, including verification of apprenticeship qualifications as required by § 4-102, Subsection 3K, for each trade or classification of craft workers it will employ on the project.
3. Subcontractor responsibility certifications shall be executed by persons having sufficient knowledge to address all matters in the certification and shall include an attestation stating, under the penalty of perjury, that all information submitted is true, complete and accurate.

§ 4-105. Contractor responsibility review and determination.

[Ord 729, 5/5/2016]

1. After a notice of intent to award contract has been issued, the Township shall undertake a review process to determine whether the prospective awardee is a qualified, responsible contractor in accordance with the requirements of this Part 1 and other applicable laws and regulations and has the resources and capabilities to successfully perform the contract. The time of the review process shall be as determined necessary by the Township, but in no event less than five calendar days.
2. As part of this review process, the Township shall ensure that the contractor responsibility certification, the subcontractor list and the subcontractor responsibility certifications, as required by this Part 1, have been submitted and properly executed.
3. The Township may conduct any additional inquiries to verify that the prospective awardee and its subcontractors have the technical qualifications and performance capabilities necessary to successfully perform the contract and that the firms have a sufficient record of law compliance and business integrity to justify the award of a public contract. In conducting such inquiries, the Township may seek relevant information from the firm, its prior clients or customers, its subcontractors or any other relevant source.
4. If at the conclusion of the review process the Township determines that all responsibility certifications have been properly completed and executed and if it concludes that the qualifications, background and responsibility of the

prospective awardee and the firms on its subcontractor list are satisfactory, it may issue a formal, written contractor responsibility determination verifying that the prospective awardee is a qualified, responsible contractor. In the event a firm is determined to be nonresponsible, the Township shall proceed to conduct a responsibility review of the next lowest, responsive bidder or, if necessary, rebid the project.

5. A contractor responsibility determination may be issued after the conclusion of the review process under Subsection 1. A responsibility determination may be revoked or revised in any manner at any time if the Township obtains relevant information warranting any such revocation or revisions.

§ 4-106. Subcontractor responsibility review requirements.

[Ord. 729, 5/5/2016]

1. A construction manager, general contractor or other lead or prime contractor shall not be permitted to use a subcontractor on any work performed for the Township unless it has identified the subcontractor on its subcontractor list and provided a subcontractor responsibility certification in accordance with the requirements of § 4-104.
2. A subcontractor listed on a firm's subcontractor list shall not be substituted unless written authorization is obtained from Township and a subcontractor responsibility certification is provided for the substitute subcontractor.
3. In the event that the Township determines that a prospective subcontractor listed by the apparent low bidder does not meet the responsibility standards of this Part 1, it may, after informing the prospective awardee, exercise one of the following options:
 - A. Permit the awardee to substitute a qualified, responsible, subcontractor in accordance with the requirements of this Part 1;
 - B. Require the awardee to self-perform the work in question if the firm has the required experience, licenses and other qualifications to perform the work in question; or
 - C. Disqualify the prospective awardee.
4. In the event that a subcontractor is disqualified under this Part 1, the general contractor, construction manager or other lead or prime contractor shall not be permitted to make any type of contractual claim against the Township on the basis of a subcontractor disqualification.

§ 4-107. False or misleading responsibility certifications.

[Ord. 729, 5/5/2016]

If the Township determines that a contractor or subcontractor responsibility certification contains false or misleading material information that was provided knowingly or with reckless disregard for the truth or omits material information knowingly or with reckless disregard of the truth, the firm for which the certification was submitted shall be prohibited from performing work for the Township for a period of three years and shall be subject to any other penalties and sanctions, including contract termination, available to the Township under law. A contract terminated under these circumstances shall further entitle the Township to withhold payment of any monies due to the firm as damages.

§ 4-108. Execution of final contract.

[Ord. 729, 5/5/2016]

1. A contract subject to this Part 1 shall not be executed until all requirements of this Part 1 have been fulfilled and until contractor and subcontractor responsibility certifications have been issued by the Township under § 4-105, Subsection 4. Upon completion of all requirements under this Part 1, the Township may execute a final contract based upon the notice of intent approved by the Board of Supervisors without further Board action.
2. Prior to the execution of a final contract under this Part 1, the Township shall publicly post the notice of intent to award, contractor and subcontractor responsibility certifications, subcontractor lists, and contractor responsibility determination on the Township website for public inspection for a period of five calendar days after the issuance of the contractor responsibility determination.

APPENDIX B
WARMINSTER TOWNSHIP'S CONTRACTOR RESPONSIBILITY CERTIFICATION

WARMINSTER TOWNSHIP'S CONTRACTOR RESPONSIBILITY CERTIFICATION

This Contractor Responsibility Certification is submitted with respect the following project in accord with the Township's Code:¹

CN 2019-06 Five Ponds Golf Course Irrigation Project

CERTIFICATION INSTRUCTIONS

1. This document must be included as part of the Bid submission. **Failure to submit a fully completed and executed Contractor Responsibility Certification will be considered justification to reject the bid.**
2. This document shall also be used by any and all Subcontractors as the Subcontractor Responsibility Certification. No separate Subcontractor Responsibility Certification form will be issued or provided by Warminster Township. When used as the Subcontractor Responsibility Certification, this document must be submitted to Warminster Township within five (5) days from the date of the Notice of Intent to Award Contract. Failure to submit a fully completed and executed Subcontractor Responsibility Certification for each Subcontractor that will be used for the above-referenced project will be considered justification to reject the bid.
3. A construction manager, general contractor, or other lead or prime contractor shall not be permitted to use a Subcontractor for any work on the referenced project unless the subcontractor has been identified on the Subcontractor list, has provided a completed and executed a Subcontractor Responsibility Certification and has been determined by Warminster Township to be a qualified, responsible contractor.
4. As part of the review process of at least five (5) days, Warminster Township shall ensure that the required Contractor Responsibility Certification, Subcontractor List, and Subcontractor Responsibility Certifications have been submitted and properly executed.

¹ See Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors].

1. GENERAL INFORMATION

- 1.1. Name of Bidder:

- 1.2. Address of Bidder:

- 1.3. Phone Number:

- 1.4. Email Address:

2. ORGANIZATIONAL BACKGROUND

- 2.1. Type of Organization

- 2.2. How long has your organization been in business?
 - A. As a Contractor: _____
 - B. As a Contractor engaged in construction work of the type proposed under this Contract: _____
 - C. Under your current business name: _____

- 2.3. For Corporation Bidders ONLY
 - A. Date and State of Incorporation:

 - B. Name and Titles of Officers:

2.4. If the bidder is other than a corporation, describe the structure of your organization including date of initiation as a business and list principals involved (please attached additional sheet if needed).

2.5. Has your organization ever operated under another name, or controls, is controlled by another company or business entity or in the past five years controlled or was controlled by another company or business entity, whether as a parent company, subsidiary or in any other business relation? If yes, attach a separate statement to this Certification which explains in detail the nature of the any such relationship.

_____ Yes, Statement Attached _____ No

3. WORK HISTORY

3.1. Attach or list the following information on similar projects which your organization has completed in the past five (5) years. Name and type of project, owner, engineer, contract amount, date of completion.

3.2. Attach or list the following information on similar projects which your organization has in progress. Name and type of project, owner, engineer, contract amount, date of completion.

4. CERTIFICATIONS

For any Certification in which the response requires additional clarification/explanation, please provide the response in an attached clearly labeled document.

4.1. Does your organization have all valid, effective licenses, registrations, or certifications required by federal, state, county, or local law, including but not limited to, licenses, registrations or certifications required to:

A. Do business in the designated local? Yes No

B. Perform the contract work it seeks to perform? Yes No

C. Do these include any and all licenses, registrations, or certifications for any type of trade work or specialty work which the firm proposes to self-perform? Yes No

4.2. Does your organization meet the bonding requirements for the contract, as required by applicable law or contract specifications, and any insurance requirements, as required by applicable law or contract specifications, including general liability insurance, workers compensation insurance, and unemployment insurance requirements?

Yes No

4.3. Has your organization ever been debarred or suspended by any federal, state, or local government agency or authority in the past three (3) year?

Yes (please provide the circumstances) No

4.4. Has your organization ever defaulted on any project in the past three (3) years?

Yes (please provide the circumstances and dates) No

4.5. Has your organization ever had any type of business, contracting or trade license, registration, or other certification suspended or revoked in the past three (3) years?

Yes (please provide the circumstances and dates) No

4.6. Has your organization or its owners been convicted of any crime relating to the contracting business in the past ten (10) years?

Yes (please provide the circumstances and dates) No

4.7. Has your organization been found in violation of any law applicable to your contracting business, including but not limited to, licensing laws, tax laws, prompt payment laws, wage or hour laws, prevailing wage laws, environmental laws or others where the result of such violation was the payment of a fine, back pay damages or any other type of penalty in the amount of \$1,000 or more in the past three (3) years?

Yes (please provide the circumstances and dates) No

4.8. Will your organization pay all craft employees that it employs on the project the current wage rates and benefits as required under applicable federal, state, and local wage laws?

Yes No (please provide further explanation)

4.9. Has all craft labor employed by the firm for this project completed at least the OSHA ten-hour training course for safety established by the United States Department of Labor, Occupational Safety, and Health Administration?

Yes No (please provide further explanation)

4.10. Will your organization employ craft employees in all classifications an individual trades required to successfully perform the work related to this project?

Yes No (please provide further explanation)

4.11. For the purposes of this Section 4, Class A Apprenticeship Program is an apprenticeship program that is currently registered with an approved by the U.S Department of Labor or a state apprenticeship agency and has graduated apprentices to journeyperson status for a t least three of the past five years.

Has your organization participated in the Class A Apprenticeship Program for the past three (3) years for each separate trade or classification in which

it employs craft employees and will continue to participate in such program(s) for the duration of this project?

Yes *(please provide a list of all trades or classifications of craft employees the organization employs for this project and documentation verifying the organization's participation in a Class A apprenticeship program for each trade or classification listed.)*

No

- 4.12. Does your organization have all the other technical qualifications and resources, including equipment, personnel, and financial resources to perform the referenced contract, or will obtain same through the use of qualified, responsible subcontractor(s)?

Yes No (please provide further explanation)

- 4.13. Will your organization maintain all qualifications, resources, and capabilities referenced in this Certification throughout the duration of the project?

Yes No (please provide further explanation)

- 4.14. Will your organization notify Warminster Township within seven (7) days of any material changes to all matters attested in this Certification?

Yes No (please provide further explanation)

- 4.15. Was this Contractor Responsibly Certification executed by a person who has sufficient knowledge to address all matters in this Certification?

Yes *(Please provide an attestation stating, under the penalty of perjury, that the information submitted is true, complete, and accurate.)*

No

5. ACKNOWLEDGEMENTS

- 5.1. I/We acknowledge that the execution of the required Contractor Responsibly Certification shall not establish a presumption of contractor responsibility, and the Township may require any additional information it deems necessary to evaluate a firm's status as a responsible contractor, including technical qualifications, financial capacity or other resources and performance capabilities. The Township may require that such information be included in a separate statement of qualifications and experience or as an attachment to the Contractor Responsibly Certification _____ (please initial)
- 5.2. I/We acknowledge that if my organization receives a notice of intent to award contract, we will provide a subcontractor list and required subcontractor information as specified in the Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors]. _____ (please initial)
- 5.3. I/We acknowledge that if the submitting firm has ever operated under another name or controls, is controlled by another company or business entity or in the past five years controlled or was controlled by another company or business entity, whether as a parent company, subsidiary or in any other business relation, it shall attach a separate statement to its Contractor Responsibly Certification that explains in detail the nature of any such relationship. Additional information may be required from such an entity if the relationship in question could potentially impact contract performance. _____ (please initial)
- 5.4. I/We acknowledge that if a firm fails to provide a Contractor Responsibly Certification required by the Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors], it shall be disqualified from bidding. No action of any nature shall lie against the Township because of its refusal to accept a bid for failing to provide information required by this section. _____ (please initial)

6. SUBCONTRACTOR INFORMATION

The organization who receives the Notice of Intent to award the contract must comply with the following requirements for all subcontractors:

- 6.1. Within five (5) days from the date of notice of intent to award contract, a prospective awardee shall submit to the Township a subcontractor list containing the names of any subcontractors that will be used for the referenced project, their addresses and a description of the work each listed subcontractor will perform on the project.
- 6.2. At the time a prospective awardee submits the subcontractor list it shall also submit Subcontractor Responsibly Certifications for all listed subcontractors to the Township. Subcontractor Responsibly Certifications shall be executed by the respective subcontractors on forms prepared by the Township and shall contain the same information and representations required in, including verification of apprenticeship qualifications as required by the Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors], for each trade or classification of craft workers it will employ on the project.
- 6.3. Subcontractor Responsibly Certification s shall be executed by persons having sufficient knowledge to address all matters in this Certification and shall include an attestation stating, under the penalty of perjury, that all information submitted is true, complete and accurate.
- 6.4. A construction manager, general contractor or other lead or prime contractor shall not be permitted to use a subcontractor on any work performed for the Township unless it has identified the subcontractor on its subcontractor list and provided a Subcontractor Responsibly Certification in accordance with the requirements of Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors].
- 6.5. A subcontractor listed on a firm's subcontractor list shall not be substituted unless written authorization is obtained from Township and a Subcontractor Responsibly Certification is provided for the substitute subcontractor.
- 6.6. In the event that the Township determines that a prospective subcontractor listed by the apparent low bidder does not meet the required responsibility standards set forth in the Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors], it may, after informing the prospective awardee, exercise one of the following options:

- A. Permit the awardee to substitute a qualified, responsible, subcontractor in accordance with the requirements of the Warminster Township Code, Chapter 4 [Buildings], Part 1 [Responsible Building Contractors],
- B. Require the awardee to self-perform the work in question if the firm has the required experience, licenses and other qualifications to perform the work in question; or
- C. Disqualify the prospective awardee.

6.7. In the event that a subcontractor is disqualified under this ordinance, the general contractor, construction manager or other lead or prime contractor shall not be permitted to make any type of contractual claim against the Township on the basis of a subcontractor disqualification.

7. SIGNATURES AND AFFIDAVIT

This Contractor Responsibility Certification has been prepared on behalf of the following organization:

Name of Organization: _____

Name of Preparer: _____

Title of Preparer: _____

Signature of Preparer: _____

Date: _____

AFFIDAVIT

State of _____, County of _____

I, _____ (Name of Official), being duly sworn, according to law, depose and say that I am the _____ (position), of the above organization, and that the responses provided in the Contractor Responsibility Certification, including any attachments thereto are true and correct to the best of my knowledge and belief.

Sworn and subscribed before on this _____ day of _____, 20____.

Notary Public

APPENDIX C
PREVAILING WAGE RATES

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project Name:	CN 2019-06 Five Ponds Golf Course Irrigation Project
Awarding Agency:	Warminster Township
Contract Award Date:	7/18/2019
Serial Number:	19-04699
Project Classification:	Building/Highway
Determination Date:	6/6/2019
Assigned Field Office:	Philadelphia
Field Office Phone Number:	(215)560-1858
Toll Free Phone Number:	
Project County:	Bucks County

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	5/29/2017		\$47.30	\$34.85	\$82.15
Asbestos & Insulation Workers	5/1/2018		\$49.30	\$35.85	\$85.15
Asbestos & Insulation Workers	5/1/2019		\$51.20	\$36.95	\$88.15
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2017		\$28.52	\$18.22	\$46.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2018		\$29.52	\$18.22	\$47.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	1/1/2019		\$29.26	\$18.48	\$47.74
Boilermakers	1/1/2017		\$44.26	\$33.36	\$77.62
Boilermakers	1/1/2018		\$46.26	\$33.36	\$79.62
Boilermakers	3/1/2018		\$45.89	\$33.73	\$79.62
Boilermakers	1/1/2019		\$45.51	\$34.11	\$79.62
Bricklayer	5/1/2017		\$40.98	\$26.78	\$67.76
Bricklayer	5/1/2018		\$43.73	\$26.78	\$70.51
Bricklayer	5/1/2019		\$46.48	\$26.78	\$73.26
Carpenter - Chief of Party (Surveying & Layout)	5/1/2017		\$45.25	\$27.59	\$72.84
Carpenter - Chief of Party (Surveying & Layout)	5/1/2018	4/30/2019	\$45.83	\$27.59	\$73.42
Carpenter - Chief of Party (Surveying & Layout)	5/1/2019	4/30/2020	\$46.54	\$27.59	\$74.13
Carpenter - Chief of Party (Surveying & Layout)	5/1/2020		\$47.73	\$27.59	\$75.32
Carpenter - Instrument Person (Surveying & Layout)	5/1/2017		\$39.35	\$27.59	\$66.94
Carpenter - Instrument Person (Surveying & Layout)	5/1/2018	4/30/2019	\$39.85	\$27.59	\$67.44
Carpenter - Instrument Person (Surveying & Layout)	5/1/2019	4/30/2020	\$40.47	\$27.59	\$68.06
Carpenter - Instrument Person (Surveying & Layout)	5/1/2020		\$41.50	\$27.59	\$69.09
Carpenter - Rodman (Surveying & Layout)	5/1/2017		\$19.68	\$19.64	\$39.32
Carpenter - Rodman (Surveying & Layout)	5/1/2018	4/30/2019	\$19.93	\$19.49	\$39.42
Carpenter - Rodman (Surveying & Layout)	5/1/2019	4/30/2020	\$20.24	\$19.69	\$39.93
Carpenter - Rodman (Surveying & Layout)	5/1/2020		\$20.75	\$19.49	\$40.24
Carpenters	5/1/2017		\$39.35	\$27.59	\$66.94
Carpenters	5/1/2018	4/30/2019	\$39.85	\$27.59	\$67.44
Carpenters	5/1/2019	4/30/2020	\$40.87	\$27.59	\$68.46
Carpenters	5/1/2020		\$41.90	\$27.59	\$69.49
Cement Masons	5/1/2017		\$36.45	\$31.76	\$68.21
Cement Masons	5/1/2018		\$37.50	\$32.26	\$69.76
Cement Masons	5/1/2019		\$38.50	\$32.81	\$71.31
DockBuilder/Pile Drivers (Building, Heavy & Highway)	5/1/2018		\$43.45	\$34.47	\$77.92
Dockbuilder/Piledriver (Building, Heavy, Highway)	11/1/2017		\$43.45	\$33.22	\$76.67
Dockbuilder/Piledriver (Building, Heavy, Highway)	5/1/2018		\$44.70	\$33.22	\$77.92
Drapery Installers	5/1/2009		\$31.09	\$21.34	\$52.43
Drywall Finisher	5/1/2017		\$37.11	\$26.75	\$63.86
Drywall Finisher	5/1/2018		\$39.27	\$27.49	\$66.76
Electricians	4/30/2017		\$56.50	\$36.24	\$92.74
Electricians	4/29/2018		\$58.33	\$37.41	\$95.74
Elevator Constructor	1/1/2016		\$52.79	\$30.29	\$83.08
Elevator Constructor	1/1/2018		\$55.76	\$33.05	\$88.81

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Floor Coverer	5/1/2019		\$44.37	\$28.44	\$72.81
Floor Coverer	5/1/2020		\$46.01	\$28.44	\$74.45
Floor Layer	5/1/2017		\$42.51	\$27.91	\$70.42
Floor Layer	5/1/2018		\$43.11	\$28.09	\$71.20
Glazier	5/1/2017		\$41.30	\$30.80	\$72.10
Glazier	5/1/2018		\$43.32	\$32.33	\$75.65
Glazier	5/1/2019		\$43.87	\$33.38	\$77.25
Iron Workers - Reinforcing Steel Mesh - Rebar	7/1/2017		\$42.56	\$29.30	\$71.86
Iron Workers - Reinforcing Steel Mesh - Rebar	7/1/2018		\$51.46	\$30.60	\$82.06
Iron Workers (Riggers)	7/1/2017		\$39.83	\$27.92	\$67.75
Iron Workers	1/1/2017		\$46.20	\$31.26	\$77.46
Iron Workers	7/1/2017		\$47.30	\$32.91	\$80.21
Iron Workers	7/1/2018		\$42.88	\$30.60	\$73.48
Laborers (Class 01 - See notes)	5/1/2017		\$28.65	\$24.95	\$53.60
Laborers (Class 02 - See notes)	5/1/2017		\$30.85	\$25.65	\$56.50
Laborers (Class 03 - See notes)	5/1/2017		\$28.92	\$25.18	\$54.10
Laborers (Class 04 - See notes)	5/1/2017		\$28.95	\$24.95	\$53.90
Laborers (Class 05 - See notes)	5/1/2017		\$28.65	\$24.95	\$53.60
Landscape Laborer	5/1/2017		\$22.71	\$23.08	\$45.79
Marble Finisher	5/1/2017		\$35.55	\$24.17	\$59.72
Marble Finisher	5/1/2018		\$37.55	\$24.17	\$61.72
Marble Finisher	5/1/2019		\$39.75	\$24.17	\$63.92
Marble Mason	5/1/2017		\$40.36	\$26.99	\$67.35
Marble Mason	5/1/2018		\$43.11	\$26.99	\$70.10
Marble Mason	5/1/2019		\$45.86	\$26.99	\$72.85
Millwright	7/1/2017		\$41.35	\$32.24	\$73.59
Millwright	5/1/2018		\$43.33	\$32.96	\$76.29
Millwright	5/1/2019		\$45.50	\$33.29	\$78.79
Operators (Building, Class 01 - See Notes)	5/1/2017		\$44.87	\$28.14	\$73.01
Operators (Building, Class 01 - See Notes)	5/1/2017		\$44.87	\$28.14	\$73.01
Operators (Building, Class 01 - See Notes)	5/1/2018		\$46.41	\$28.60	\$75.01
Operators (Building, Class 01 - See Notes)	5/1/2019		\$47.95	\$29.06	\$77.01
Operators (Building, Class 01 - See Notes)	5/1/2020		\$49.50	\$29.51	\$79.01
Operators (Building, Class 01 - See Notes)	5/1/2021		\$51.04	\$29.97	\$81.01
Operators (Building, Class 01A - See Notes)	5/1/2017		\$47.86	\$29.03	\$76.89
Operators (Building, Class 01A - See Notes)	5/1/2018		\$49.41	\$29.49	\$78.90
Operators (Building, Class 01A - See Notes)	5/1/2019		\$50.96	\$29.94	\$80.90
Operators (Building, Class 01A - See Notes)	5/1/2020		\$52.50	\$30.40	\$82.90
Operators (Building, Class 01A - See Notes)	5/1/2021		\$54.05	\$30.85	\$84.90
Operators (Building, Class 02 - See Notes)	5/1/2017		\$44.62	\$28.07	\$72.69
Operators (Building, Class 02 - See Notes)	5/1/2018		\$46.16	\$28.53	\$74.69
Operators (Building, Class 02 - See Notes)	5/1/2019		\$47.70	\$28.99	\$76.69
Operators (Building, Class 02 - See Notes)	5/1/2020		\$49.25	\$29.44	\$78.69
Operators (Building, Class 02 - See Notes)	5/1/2021		\$50.80	\$29.89	\$80.69

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Building, Class 02A - See Notes)	5/1/2017		\$47.61	\$28.97	\$76.58
Operators (Building, Class 02A - See Notes)	5/1/2018		\$49.16	\$29.42	\$78.58
Operators (Building, Class 02A - See Notes)	5/1/2019		\$50.71	\$29.87	\$80.58
Operators (Building, Class 02A - See Notes)	5/1/2020		\$52.26	\$30.31	\$82.57
Operators (Building, Class 02A - See Notes)	5/1/2021		\$53.81	\$30.77	\$84.58
Operators (Building, Class 03 - See Notes)	5/1/2017		\$40.53	\$26.87	\$67.40
Operators (Building, Class 03 - See Notes)	5/1/2018		\$42.07	\$27.33	\$69.40
Operators (Building, Class 03 - See Notes)	5/1/2019		\$43.62	\$27.78	\$71.40
Operators (Building, Class 03 - See Notes)	5/1/2020		\$45.17	\$28.24	\$73.41
Operators (Building, Class 03 - See Notes)	5/1/2021		\$46.71	\$28.69	\$75.40
Operators (Building, Class 04 - See Notes)	5/1/2017		\$40.24	\$26.78	\$67.02
Operators (Building, Class 04 - See Notes)	5/1/2018		\$41.78	\$27.22	\$69.00
Operators (Building, Class 04 - See Notes)	5/1/2019		\$43.32	\$27.69	\$71.01
Operators (Building, Class 04 - See Notes)	5/1/2020		\$44.86	\$28.14	\$73.00
Operators (Building, Class 04 - See Notes)	5/1/2021		\$46.41	\$28.60	\$75.01
Operators (Building, Class 05 - See Notes)	5/1/2017		\$38.51	\$26.27	\$64.78
Operators (Building, Class 05 - See Notes)	5/1/2018		\$40.05	\$26.73	\$66.78
Operators (Building, Class 05 - See Notes)	5/1/2019		\$41.60	\$27.18	\$68.78
Operators (Building, Class 05 - See Notes)	5/1/2020		\$43.14	\$27.64	\$70.78
Operators (Building, Class 05 - See Notes)	5/1/2021		\$44.69	\$28.10	\$72.79
Operators (Building, Class 06 - See Notes)	5/1/2017		\$37.52	\$25.98	\$63.50
Operators (Building, Class 06 - See Notes)	5/1/2018		\$39.07	\$26.43	\$65.50
Operators (Building, Class 06 - See Notes)	5/1/2019		\$40.61	\$26.89	\$67.50
Operators (Building, Class 06 - See Notes)	5/1/2020		\$42.16	\$27.35	\$69.51
Operators (Building, Class 06 - See Notes)	5/1/2021		\$43.70	\$27.80	\$71.50
Operators (Building, Class 07A- See Notes)	5/1/2017		\$54.14	\$32.47	\$86.61
Operators (Building, Class 07A- See Notes)	5/1/2018		\$55.99	\$33.02	\$89.01
Operators (Building, Class 07A- See Notes)	5/1/2019		\$57.84	\$33.57	\$91.41
Operators (Building, Class 07A- See Notes)	5/1/2020		\$59.70	\$34.10	\$93.80
Operators (Building, Class 07A- See Notes)	5/1/2021		\$61.55	\$34.65	\$96.20
Operators (Building, Class 07B- See Notes)	5/1/2017		\$53.84	\$32.40	\$86.24
Operators (Building, Class 07B- See Notes)	5/1/2018		\$55.70	\$32.92	\$88.62
Operators (Building, Class 07B- See Notes)	5/1/2019		\$57.55	\$33.47	\$91.02
Operators (Building, Class 07B- See Notes)	5/1/2020		\$59.40	\$34.03	\$93.43
Operators (Building, Class 07B- See Notes)	5/1/2021		\$61.26	\$34.58	\$95.84
Painter	5/1/2018		\$38.64	\$27.64	\$66.28
Painter	5/1/2019		\$39.04	\$28.99	\$68.03
Painters Class 1 (see notes)	5/1/2017		\$37.82	\$26.46	\$64.28
Painters Class 1 (see notes)	2/1/2018		\$43.18	\$27.23	\$70.41
Painters Class 1 (see notes)	2/1/2019		\$44.56	\$28.35	\$72.91
Painters (Bridges, Stacks, Towers)	2/1/2018		\$54.15	\$27.52	\$81.67
Painters (Bridges, Stacks, Towers)	2/1/2019		\$55.52	\$28.39	\$83.91
Painters (Brush and Roller)(Industrial)	2/1/2018		\$43.18	\$27.23	\$70.41
Painters (Brush and Roller)(Industrial)	2/1/2019		\$44.56	\$28.35	\$72.91

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Painters Class 2 (see notes)	5/1/2017		\$53.67	\$26.09	\$79.76
Painters Class 2 (see notes)	2/1/2018		\$54.14	\$27.27	\$81.41
Painters Class 2 (see notes)	2/1/2019		\$55.52	\$28.39	\$83.91
Painters Class 3 (see notes)	5/1/2017		\$38.20	\$26.46	\$64.66
Plasterers	5/1/2017		\$37.42	\$28.83	\$66.25
Plasterers	5/1/2018		\$37.42	\$30.04	\$67.46
Plasterers	5/1/2019		\$37.72	\$30.74	\$68.46
plumber	5/1/2018		\$53.45	\$33.54	\$86.99
plumber	5/1/2019		\$55.45	\$34.54	\$89.99
Plumbers	5/1/2017		\$51.42	\$32.57	\$83.99
Pointers, Caulkers, Cleaners	5/1/2017		\$42.26	\$25.69	\$67.95
Pointers, Caulkers, Cleaners	5/1/2018		\$45.01	\$25.69	\$70.70
Pointers, Caulkers, Cleaners	5/1/2019		\$47.76	\$25.69	\$73.45
Roofers (Composition)	5/1/2017		\$36.15	\$30.22	\$66.37
Roofers (Composition)	5/1/2018		\$37.15	\$31.27	\$68.42
Roofers (Shingle)	5/1/2016		\$25.70	\$19.17	\$44.87
Roofers (Shingle, Slate, Tile)	5/1/2018		\$27.50	\$20.37	\$47.87
Roofers (Slate & Tile)	5/1/2016		\$28.70	\$19.17	\$47.87
Roofers (Slate & Tile)	5/1/2018		\$30.50	\$20.37	\$50.87
Sheet Metal Workers	5/1/2017		\$46.42	\$39.51	\$85.93
Sheet Metal Workers	5/1/2018		\$47.58	\$41.60	\$89.18
Sheet Metal Workers	5/1/2019		\$49.79	\$42.89	\$92.68
Sprinklerfitters	4/1/2017		\$37.40	\$21.74	\$59.14
Sprinklerfitters	4/1/2018		\$38.80	\$22.74	\$61.54
Sprinklerfitters	5/1/2019		\$57.20	\$28.32	\$85.52
Steamfitters	5/1/2017		\$54.64	\$32.53	\$87.17
Steamfitters	5/1/2018		\$56.37	\$34.39	\$90.76
Steamfitters	5/1/2019		\$58.17	\$35.99	\$94.16
Stone Masons	5/1/2017		\$40.36	\$26.99	\$67.35
Stone Masons	5/1/2018		\$43.11	\$26.99	\$70.10
Stone Masons	5/1/2019		\$45.86	\$26.99	\$72.85
Terrazzo Finisher	5/1/2017		\$39.06	\$22.73	\$61.79
Terrazzo Finisher	5/1/2018		\$41.31	\$22.73	\$64.04
Terrazzo Finisher	5/1/2019		\$43.61	\$22.73	\$66.34
Terrazzo Grinder	5/1/2017		\$39.33	\$22.73	\$62.06
Terrazzo Grinder	5/1/2018		\$41.58	\$22.73	\$64.31
Terrazzo Grinder	5/1/2019		\$43.98	\$22.73	\$66.71
Terrazzo Mechanics	5/1/2017		\$43.71	\$24.81	\$68.52
Terrazzo Mechanics	5/1/2018		\$46.46	\$24.81	\$71.27
Terrazzo Mechanics	5/1/2019		\$49.21	\$24.81	\$74.02
Tile Finisher	5/1/2017		\$35.55	\$24.17	\$59.72
Tile Finisher	5/1/2018		\$37.55	\$24.17	\$61.72
Tile Finisher	5/1/2019		\$39.75	\$24.17	\$63.92
Tile Setter	5/1/2017		\$43.71	\$24.81	\$68.52

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Tile Setter	5/1/2018		\$46.46	\$24.81	\$71.27
Tile Setter	5/1/2019		\$49.21	\$24.81	\$74.02
Truckdriver class 1(see notes)	5/1/2017		\$30.46	\$17.96	\$48.42
Truckdriver class 1(see notes)	5/1/2018		\$31.93	\$17.96	\$49.89
Truckdriver class 1(see notes)	5/1/2019		\$32.21	\$19.19	\$51.40
Truckdriver class 1(see notes)	5/1/2020		\$34.93	\$17.96	\$52.89
Truckdriver class 1(see notes)	5/1/2021		\$36.48	\$17.96	\$54.44
Truckdriver class 2 (see notes)	5/1/2017		\$30.56	\$17.96	\$48.52
Truckdriver class 2 (see notes)	5/1/2018		\$32.03	\$17.96	\$49.99
Truckdriver class 2 (see notes)	5/1/2019		\$32.31	\$19.19	\$51.50
Truckdriver class 2 (see notes)	5/1/2020		\$35.03	\$17.96	\$52.99
Truckdriver class 2 (see notes)	5/1/2021		\$36.58	\$17.96	\$54.54
Truckdriver class 3 (see notes)	5/1/2017		\$30.81	\$17.96	\$48.77
Truckdriver class 3 (see notes)	5/1/2018		\$32.28	\$17.96	\$50.24
Truckdriver class 3 (see notes)	5/1/2019		\$32.56	\$19.19	\$51.75
Truckdriver class 3 (see notes)	5/1/2020		\$35.28	\$17.96	\$53.24
Truckdriver class 3 (see notes)	5/1/2021		\$36.83	\$17.96	\$54.79

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter - Chief of Party (Surveying & Layout)	5/1/2017		\$51.42	\$27.39	\$78.81
Carpenter - Chief of Party (Surveying & Layout)	5/1/2018	4/30/2019	\$53.20	\$27.69	\$80.89
Carpenter - Chief of Party (Surveying & Layout)	5/1/2019	4/30/2020	\$55.38	\$27.69	\$83.07
Carpenter - Chief of Party (Surveying & Layout)	5/1/2020	4/30/2021	\$57.63	\$27.69	\$85.32
Carpenter - Chief of Party (Surveying & Layout)	5/1/2021		\$59.93	\$27.69	\$87.62
Carpenter - Instrument Person (Surveying & Layout)	5/1/2017		\$44.71	\$27.39	\$72.10
Carpenter - Instrument Person (Surveying & Layout)	5/1/2018	4/30/2019	\$46.26	\$27.69	\$73.95
Carpenter - Instrument Person (Surveying & Layout)	5/1/2019	4/30/2020	\$48.16	\$27.69	\$75.85
Carpenter - Instrument Person (Surveying & Layout)	5/1/2020	4/30/2021	\$50.11	\$27.69	\$77.80
Carpenter - Instrument Person (Surveying & Layout)	5/1/2021		\$52.11	\$27.69	\$79.80
Carpenter - Rodman (Surveying & Layout)	5/1/2017		\$35.77	\$21.19	\$56.96
Carpenter - Rodman (Surveying & Layout)	5/1/2018	4/30/2019	\$37.01	\$21.34	\$58.35
Carpenter - Rodman (Surveying & Layout)	5/1/2019	4/30/2020	\$38.53	\$21.34	\$59.87
Carpenter - Rodman (Surveying & Layout)	5/1/2020	4/30/2021	\$40.09	\$21.34	\$61.43
Carpenter - Rodman (Surveying & Layout)	5/1/2021		\$41.69	\$21.34	\$63.03
Carpenter	5/1/2018	4/30/2019	\$46.26	\$27.69	\$73.95
Carpenter	5/1/2019	4/30/2020	\$47.81	\$28.04	\$75.85
Carpenter	5/1/2020	4/30/2021	\$49.76	\$28.04	\$77.80
Carpenter	5/1/2021		\$51.76	\$28.04	\$79.80
Carpenters	5/1/2017		\$44.71	\$27.39	\$72.10
Carpenters	5/1/2018		\$46.56	\$27.39	\$73.95
Carpenters	5/1/2019		\$48.46	\$27.39	\$75.85
Carpenters	5/1/2020		\$50.41	\$27.39	\$77.80
Carpenters	5/1/2021		\$52.41	\$27.39	\$79.80
Cement Masons	5/1/2017		\$34.45	\$31.51	\$65.96
Cement Masons	5/1/2018		\$35.65	\$32.01	\$67.66
Cement Masons	5/1/2019		\$37.90	\$31.51	\$69.41
Cement Masons	5/1/2020		\$39.70	\$31.51	\$71.21
Cement Masons	5/1/2021		\$41.55	\$31.51	\$73.06
Electric Lineman	5/29/2017		\$52.60	\$26.37	\$78.97
Electric Lineman	5/28/2018		\$53.64	\$27.45	\$81.09
Electric Lineman	5/27/2019		\$54.66	\$28.56	\$83.22
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2016		\$46.20	\$31.26	\$77.46
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	1/1/2017		\$46.20	\$31.26	\$77.46
Iron Workers	7/1/2017		\$47.30	\$32.91	\$80.21
Laborers (Class 01 - See notes)	5/1/2017		\$29.75	\$25.65	\$55.40
Laborers (Class 01 - See notes)	5/1/2018		\$31.25	\$25.65	\$56.90
Laborers (Class 01 - See notes)	5/1/2019		\$32.80	\$25.65	\$58.45
Laborers (Class 01 - See notes)	5/1/2020		\$34.45	\$25.65	\$60.10
Laborers (Class 01 - See notes)	5/1/2021		\$36.20	\$25.65	\$61.85
Laborers (Class 02 - See notes)	5/1/2017		\$29.95	\$25.65	\$55.60
Laborers (Class 02 - See notes)	5/1/2018		\$31.45	\$25.65	\$57.10
Laborers (Class 02 - See notes)	5/1/2019		\$33.00	\$25.65	\$58.65

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 02 - See notes)	5/1/2020		\$34.65	\$25.65	\$60.30
Laborers (Class 02 - See notes)	5/1/2021		\$36.40	\$25.65	\$62.05
Laborers (Class 03 - See notes)	5/1/2017		\$29.95	\$25.65	\$55.60
Laborers (Class 03 - See notes)	5/1/2018		\$31.45	\$25.65	\$57.10
Laborers (Class 03 - See notes)	5/1/2019		\$33.00	\$25.65	\$58.65
Laborers (Class 03 - See notes)	5/1/2020		\$34.65	\$25.65	\$60.30
Laborers (Class 03 - See notes)	5/1/2021		\$36.40	\$25.65	\$62.05
Laborers (Class 04 - See notes)	5/1/2017		\$24.55	\$25.65	\$50.20
Laborers (Class 04 - See notes)	5/1/2018		\$26.05	\$25.65	\$51.70
Laborers (Class 04 - See notes)	5/1/2019		\$27.60	\$25.65	\$53.25
Laborers (Class 04 - See notes)	5/1/2020		\$29.25	\$25.65	\$54.90
Laborers (Class 04 - See notes)	5/1/2021		\$31.00	\$25.65	\$56.65
Laborers (Class 05 - See notes)	5/1/2017		\$30.60	\$25.65	\$56.25
Laborers (Class 05 - See notes)	5/1/2018		\$32.10	\$25.65	\$57.75
Laborers (Class 05 - See notes)	5/1/2019		\$33.65	\$25.65	\$59.30
Laborers (Class 05 - See notes)	5/1/2020		\$35.30	\$25.65	\$60.95
Laborers (Class 05 - See notes)	5/1/2021		\$37.05	\$25.65	\$62.70
Laborers (Class 06 - See notes)	5/1/2017		\$30.65	\$25.65	\$56.30
Laborers (Class 06 - See notes)	5/1/2018		\$32.15	\$25.65	\$57.80
Laborers (Class 06 - See notes)	5/1/2019		\$33.70	\$25.65	\$59.35
Laborers (Class 06 - See notes)	5/1/2020		\$35.35	\$25.65	\$61.00
Laborers (Class 06 - See notes)	5/1/2021		\$37.10	\$25.65	\$62.75
Laborers (Class 07 - See notes)	5/1/2017		\$30.50	\$25.65	\$56.15
Laborers (Class 07 - See notes)	5/1/2018		\$32.00	\$25.65	\$57.65
Laborers (Class 07 - See notes)	5/1/2019		\$33.55	\$25.65	\$59.20
Laborers (Class 07 - See notes)	5/1/2020		\$35.20	\$25.65	\$60.85
Laborers (Class 07 - See notes)	5/1/2021		\$36.95	\$25.65	\$62.60
Laborers (Class 08 - See notes)	5/1/2017		\$30.25	\$25.65	\$55.90
Laborers (Class 08 - See notes)	5/1/2018		\$31.75	\$25.65	\$57.40
Laborers (Class 08 - See notes)	5/1/2019		\$33.30	\$25.65	\$58.95
Laborers (Class 08 - See notes)	5/1/2020		\$34.95	\$25.65	\$60.60
Laborers (Class 08 - See notes)	5/1/2021		\$36.70	\$25.65	\$62.35
Laborers (Class 09 - See notes)	5/1/2017		\$30.10	\$25.65	\$55.75
Laborers (Class 09 - See notes)	5/1/2018		\$31.60	\$25.65	\$57.25
Laborers (Class 09 - See notes)	5/1/2019		\$33.15	\$25.65	\$58.80
Laborers (Class 09 - See notes)	5/1/2020		\$34.80	\$25.65	\$60.45
Laborers (Class 09 - See notes)	5/1/2021		\$36.55	\$25.65	\$62.20
Laborers (Class 10- See notes)	5/1/2017		\$30.25	\$25.65	\$55.90
Laborers (Class 10- See notes)	5/1/2018		\$31.75	\$25.65	\$57.40
Laborers (Class 10- See notes)	5/1/2018		\$33.30	\$25.65	\$58.95
Laborers (Class 10- See notes)	5/1/2020		\$34.95	\$25.65	\$60.60
Laborers (Class 10- See notes)	5/1/2021		\$36.70	\$25.65	\$62.35
Laborers (Class 11 -See Notes)	5/1/2017		\$30.15	\$25.65	\$55.80
Laborers (Class 11 -See Notes)	5/1/2018		\$31.55	\$25.65	\$57.20

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 11 -See Notes)	5/1/2019		\$33.10	\$25.65	\$58.75
Laborers (Class 11 -See Notes)	5/1/2020		\$34.75	\$25.65	\$60.40
Laborers (Class 11 -See Notes)	5/1/2021		\$36.50	\$25.65	\$62.15
Laborers (Class 12 -See Notes)	5/1/2017		\$31.85	\$25.65	\$57.50
Laborers (Class 12 -See Notes)	5/1/2018		\$32.45	\$25.65	\$58.10
Laborers (Class 12 -See Notes)	5/1/2019		\$34.00	\$25.65	\$59.65
Laborers (Class 12 -See Notes)	5/1/2020		\$35.65	\$25.65	\$61.30
Laborers (Class 12 -See Notes)	5/1/2021		\$37.40	\$25.65	\$63.05
Laborers (Class 13 -See Notes)	5/1/2017		\$33.88	\$25.65	\$59.53
Laborers (Class 13 -See Notes)	5/1/2018		\$35.38	\$25.65	\$61.03
Laborers (Class 13 -See Notes)	5/1/2019		\$36.93	\$25.65	\$62.58
Laborers (Class 13 -See Notes)	5/1/2020		\$38.58	\$25.65	\$64.23
Laborers (Class 13 -See Notes)	5/1/2021		\$40.33	\$25.65	\$65.98
Laborers (Class 14 -See Notes)	5/1/2017		\$30.00	\$25.65	\$55.65
Laborers (Class 14 -See Notes)	5/1/2018		\$31.50	\$25.65	\$57.15
Laborers (Class 14 -See Notes)	5/1/2019		\$33.05	\$25.65	\$58.70
Laborers (Class 14 -See Notes)	5/1/2020		\$34.70	\$25.65	\$60.35
Laborers (Class 14 -See Notes)	5/1/2021		\$36.45	\$25.65	\$62.10
Laborers Utility (PGW ONLY) (Flagperson)	5/1/2017		\$23.52	\$17.58	\$41.10
Laborers Utility (PGW ONLY)	5/1/2017		\$30.55	\$17.58	\$48.13
Landscape Laborer	5/1/2016		\$21.19	\$22.65	\$43.84
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2017		\$44.87	\$28.14	\$73.01
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2018		\$46.41	\$28.60	\$75.01
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2019		\$47.95	\$29.06	\$77.01
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2020		\$49.50	\$29.51	\$79.01
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2021		\$51.04	\$29.97	\$81.01
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2017		\$47.86	\$29.03	\$76.89
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2018		\$49.41	\$29.49	\$78.90
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2019		\$50.96	\$29.94	\$80.90
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2020		\$52.50	\$30.40	\$82.90
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2021		\$54.05	\$30.85	\$84.90
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2017		\$44.62	\$28.07	\$72.69
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2018		\$46.16	\$28.53	\$74.69
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2019		\$47.70	\$28.99	\$76.69
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2020		\$49.25	\$29.44	\$78.69

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2021		\$50.80	\$29.89	\$80.69
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2017		\$47.61	\$28.97	\$76.58
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2018		\$49.16	\$29.42	\$78.58
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2020		\$52.26	\$30.31	\$82.57
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2021		\$53.81	\$30.77	\$84.58
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2017		\$40.53	\$26.87	\$67.40
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2018		\$42.07	\$27.33	\$69.40
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2019		\$43.62	\$27.78	\$71.40
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2020		\$45.17	\$28.24	\$73.41
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2021		\$46.71	\$28.69	\$75.40
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2017		\$40.24	\$26.78	\$67.02
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2018		\$41.78	\$27.22	\$69.00
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2019		\$43.32	\$27.69	\$71.01
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2020		\$44.86	\$28.14	\$73.00
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2021		\$46.41	\$28.60	\$75.01
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2017		\$38.51	\$26.27	\$64.78
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2018		\$40.05	\$26.73	\$66.78
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2019		\$41.60	\$27.18	\$68.78
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2020		\$43.14	\$27.64	\$70.78
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2021		\$44.69	\$28.10	\$72.79
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2017		\$37.52	\$25.98	\$63.50
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2018		\$39.07	\$26.43	\$65.50
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2019		\$40.61	\$26.89	\$67.50
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2020		\$42.16	\$27.35	\$69.51
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2021		\$43.70	\$27.80	\$71.50
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2017		\$54.14	\$32.47	\$86.61
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2018		\$55.99	\$33.02	\$89.01

**BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES**

Project: 19-04699 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2019		\$57.84	\$33.57	\$91.41
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2020		\$59.70	\$34.10	\$93.80
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2021		\$61.55	\$34.65	\$96.20
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2017		\$53.84	\$32.40	\$86.24
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2018		\$55.70	\$32.92	\$88.62
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2019		\$57.55	\$33.47	\$91.02
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2020		\$59.40	\$34.03	\$93.43
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2021		\$61.28	\$34.58	\$95.86
Painters (Bridges, Stacks, Towers)	2/1/2017		\$53.67	\$26.09	\$79.76
Painters (Bridges, Stacks, Towers)	2/1/2018		\$54.14	\$27.27	\$81.41
Painters (Bridges, Stacks, Towers)	2/1/2019		\$55.52	\$28.39	\$83.91
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2017		\$51.91	\$32.53	\$84.44
Steamfitters	5/1/2018		\$56.37	\$34.39	\$90.76
Truckdriver class 1(see notes)	5/1/2017		\$30.31	\$17.96	\$48.27
Truckdriver class 1(see notes)	5/1/2018		\$31.78	\$17.96	\$49.74
Truckdriver class 1(see notes)	5/1/2019		\$32.06	\$19.19	\$51.25
Truckdriver class 1(see notes)	5/1/2020		\$34.78	\$17.96	\$52.74
Truckdriver class 1(see notes)	5/1/2021		\$36.33	\$17.96	\$54.29
Truckdriver class 2 (see notes)	5/1/2017		\$30.41	\$17.96	\$48.37
Truckdriver class 2 (see notes)	5/1/2018		\$31.88	\$17.96	\$49.84
Truckdriver class 2 (see notes)	5/1/2019		\$32.16	\$19.19	\$51.35
Truckdriver class 2 (see notes)	5/1/2020		\$34.88	\$17.96	\$52.84
Truckdriver class 2 (see notes)	5/1/2021		\$36.43	\$17.96	\$54.39
Truckdriver class 3 (see notes)	5/1/2017		\$30.66	\$17.96	\$48.62
Truckdriver class 3 (see notes)	5/1/2018		\$32.13	\$17.96	\$50.09
Truckdriver class 3 (see notes)	5/1/2019		\$32.41	\$19.19	\$51.60
Truckdriver class 3 (see notes)	5/1/2020		\$35.13	\$17.96	\$53.09
Truckdriver class 3 (see notes)	5/1/2021		\$36.68	\$17.96	\$54.64