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 James Mercer, A.D., Project Manager Date
 Pennsylvania Game Commission

TECHNICAL SPECIFICATIONS

The following stipulations, specifications and description of work are defined and described as Technical Specifications and it is understood and agreed that everything herein contained is hereby made part of the contract. Wherever any feature of the work is not fully set forth in these Technical Specifications, it must be understood that the same shall be governed by the rules of the best prevailing practice for that class of work, as determined by the Game Commission’s Representative.

These Technical Specifications and any drawings, maps and/or plans forming a part thereof, will cover the furnishing of all labor, technical assistance, equipment, tools and materials necessary to perform the design and construction work, as required under this contract.

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DRAWINGS

The following drawings are included:

- 1 of 5 – Location map, Floor Plan and Elevations
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- 3 of 5 - Electrical Details
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TECHNICAL SPECIFICATION SECTION 1 - SUMMARY OF WORK

1.1 – SCOPE OF PROJECT

The intent of this project is to construct a new 40' x 80' pole building to serve as the Pennsylvania Game Commission (PGC) maintenance crew headquarters. The new building is located in Scott Township, Lawrence County on State Game Lands #216. The project consists of constructing the pole building with concrete floor slabs, framing out the new building, installing metal roofing and siding panels, installing insulation and interior gypsum wall panels, installing doors, windows, and other building appurtenances and installing the electrical and plumbing systems. Connections of the utilities for the new building are part of this project and include electric, septic tank with sand mound and water supply system (all existing). Demolition of the existing building is under another contract. The site is fairly level but will need some additional fill w/stone for the parking area. This is included in the quantities.

1.2 – WORK AREA

The work area for this project is on State Game Lands #216. The building site is located at 540 Game farm Road, New Castle, PA 16101. Game Farm Road is about 1.2 miles south of Harlansburg, PA. The property is owned by the PGC.

1.3 – WORK HOURS

The work hours at the project site are during regular PGC business hours which are Monday through Friday, 7:00AM to 3:30PM. Work during different hours is permitted with prior approval by the PGC. Requests should be submitted two days in advance.

1.4 – ACCESS TO WORK AREA

Access to the work area is from the Game Lands Road off of Sunnyside Rd. The Contractor may use any available space to store equipment or materials on site with permission from the PGC, but must provide access for PGC to and from the site.

1.5 – SITE LAYOUT AND PREPARATION

The PGC will approximately locate the building footprint and also mark the floor elevation during the initial job conference. The Contractor is responsible for the new building construction, installing the required utility systems and/or lines and grading/placement of the stone parking area around the new building.

1.6 – PERMITS, LAWS AND REGULATIONS

The Contractor shall procure and pay for all permits, licenses, inspections, conveniences, or other approvals necessary for the execution of the contract. The PGC will secure a building permit from the PA Department of Labor & Industry (L&I) for construction of this building at no cost to the contractor. A copy of this permit will be provided to the contractor along with an inspection log checklist. The contractor shall notify the L&I inspector and coordinate with the PGC so that the required inspections take place and the project is not unduly delayed. ***Local building code officials have no jurisdiction over this project.***

The Contractor shall comply with all laws, ordinances, rules, orders and regulations relating to the performance of the work, the protection of adjacent property, the maintaining of surface passageways, safety measures, and/or other protective facilities.

All applicable Federal and State laws and regulations and regulations of all utilities, having jurisdiction over construction of the project shall apply to the contract throughout, and they shall be deemed to be included in the contract as a part, thereof, the same as though herein written out in full.

All regulations of the Occupational Safety and Health Act are in effect on this contract. It will be the Contractor's responsibility to make himself aware of all appropriate County, State and Federal regulations that apply to this contract.

Any violations incurred from improper execution of the above provisions shall be paid for by the Contractor. Loss of time on the project from such violations will not be tolerated.

TECHNICAL SPECIFICATION SECTION 2 - EROSION AND SEDIMENTATION CONTROL

2.1 -SCOPE

This work is implementing the erosion and sedimentation control measures to protect the surrounding environment. Compliance is required with Chapter 102 of the Department of Environmental Protection's regulations is also required.

2.2 - PROCEDURE

The Contractor shall install a 12-inch diameter silt sock around the building site. The silt sock shall be anchored with 1" x 1" x 3' wood posts on 8-foot centers. The end of the silt sock shall be extended uphill so that water cannot flow around the barrier.

Failure to implement soil erosion and sediment pollution control measures may result in a cease and desist order, causing shutdown of the work. No extension of time, nor additional compensation will be granted if such a shutdown should occur as a result of act or neglect of the Contractor.

Immediately upon completion of any segment of the project, seed that segment in accordance with Technical Specification Section 26. The Contractor may, with the approval of the Game Commission, perform temporary seeding operations in order to maintain finished graded areas until the optimum time for performing permanent seeding. Areas that will be surfaced by stone to serve as parking areas of driveways do not need to be seeded.

Periodically remove accumulated sediments from control measures and dispose of in suitable work areas. Remove all temporary erosion and sediment pollution control measures upon completion of construction, unless otherwise directed by the Game Commission.

2.3 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 3 - EXCAVATION

3.1- SCOPE

This work involves the drilling, hauling, and disposal of all materials encountered for construction of the building pole foundations, installation of drainage pipes and water lines and other utilities, as indicated on the Drawings, or designated by the Game Commission.

3.2 - PROCEDURE

A. General - Follow all guidelines set forth in the Construction Industry Standards, OSHA 2207, of the Occupational Safety and Health Administration, U.S. Department of Labor. Protect the work, adjacent buildings, and property.

The Contractor is required to contact the PA One Call System at 8-1-1 or 1-800-242-1776 (outside PA) prior to excavation operations at the site.

During excavation operations, keep the top surface graded for drainage. Do not over-excavate because unauthorized excavation and replacement of materials in the over-excavated areas will not be measured and paid for. Replace over-excavated work with concrete, gravel, earth or other materials designated by, and at no additional cost to the Game Commission.

B. Excavation - Remove all materials to the limits shown on the Drawings or as necessary to construct the pole foundations for the new building and for installation of utility lines.

C. Disposal – Suitable excavated materials will be used for backfill of drainage pipes, utility lines and building pole foundations. The excavated materials will also be used to establish the finished grade around the new building. This project is intended to be a balanced cut/fill job and the Contractor will not be required to transport extra material off the site.

3.3 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 4 - COMPACTED BACKFILL

4.1 - SCOPE

This work is backfilling around the completed pole foundations and installed utility lines with suitable materials obtained from the required excavation as shown on the Drawings, or as directed by the Game Commission.

4.2 - MATERIALS

Secure backfill materials from the required excavation. The onsite soil may contain cobbles and boulders which are not suitable for backfill around pipes or concrete foundations. Screening of the excavated soils may be necessary to separate objectionable stones and other debris from the backfill material. Materials shall be free from roots, brush, frozen and other objectionable materials, and stones having any dimension greater than three (3) inches. The Game Commission will decide the material's suitability for use as backfill during excavation operations.

4.3 - PROCEDURE

Conduct backfill operations so that the building foundations and utility lines are not damaged. At your own expense, and to the satisfaction of the Game Commission, repair or replace any structure damaged by your operations.

Place backfill in the dry. Place material in layers not exceeding four (4) inches in depth and compact each layer with vibratory compactors. Where working clearances permit, backfill may be placed in layers not exceeding eight (8) inches in depth, and compacted with a roller. Do not drop backfill materials, but scatter and bring up evenly. Add water or dry the backfill materials as necessary to attain as close to the optimum moisture content as possible during compaction. No free water shall drain off and adversely affect the underlying or adjacent materials. Acceptable compaction will be determined on the basis of non-movement of the material under the compaction equipment. If the density and/or moisture content of the backfill is not satisfactory, replace and/or recompact the materials to the satisfaction of, and at no additional cost to the Game Commission.

4.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO.5 - AGGREGATE

5.1 - SCOPE

This work is providing a subbase for concrete slabs, backfilling around the completed foundation drains and utility lines with #2A coarse aggregate, #57 coarse aggregate and AASHTO #10 stone as shown on the Drawings. Work also includes stone around perimeter of building and parking area.

5.2 - APPLICABLE PUBLICATIONS

AASHTO T 27 - Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates.

Pub. 408 - Specifications,
Pennsylvania Department of Transportation.

Bulletin 14 - Aggregate Producers,
Pennsylvania Department of Transportation.

5.3 - MATERIALS

Aggregate used for the subbase of concrete slabs shall be Type C, #2A coarse aggregate, as specified in Section 703.2 of Pub. 408.

Aggregate used for backfilling around the foundation drain pipes shall be Type A, #57 coarse aggregate as specified in Section 703.2 of Pub. 408.

AASHTO #10 stone shall also be used to backfill around installed water lines, electric conduit and drainage pipes.

Obtain aggregates from a source listed in Bulletin 14.

5.4 - PROCEDURE

Place aggregates and stone in the dry, and not on frozen ground for concrete slab foundations. Conduct aggregate placement operations in such a way that the permanent structures are not damaged.

At concrete slab foundations, place stone in loose layers not exceeding 4 inches in depth, and compact each layer with mechanical tampers or other approved means. If working clearances permit, place stone in loose layers not exceeding 8 inches in depth and compact each layer with rollers, tracked vehicles or other approved equipment. After compacting to the required thickness shown on the Drawings, accurately shape the foundation bed by a template to provide uniform contact for concrete placement.

For the backfill around the foundation drain pipes, place #57 coarse aggregate as soon as practicable after the drain pipes are in place. Compaction of this material is not required.

For backfill of water lines, electric conduit and drain pipes, place AASHTO #10 stone in the bottom of the excavated trenches. Shape the stone as necessary to provide uniform contact around the pipes and conduits. After the conduits and pipes are installed, place AASHTO #10 stone over the pipes to provide a cushion before placing compacted backfill.

5.5 - MEASUREMENT AND PAYMENT

Tons, measured by the weight slips from stone supplier, as applicable for the three types of aggregate used for the project.

Aggregate used for replacing caved-in-material, and material excavated beyond the established payment lines will not be measured and paid for.

TECHNICAL SPECIFICATION SECTION 6 – VAPOR BARRIER

6.1 - SCOPE

This work is providing and installing a polyethylene vapor barrier under the concrete floor slab for the new building as shown on the Drawings.

6.2 – MATERIALS – The vapor barrier shall be a polyethylene sheet conforming to ASTM E 1745 and ASTM D4397 with a minimum thickness of 10 mils and a perm rating of <0.03 perms. No C&A film is to be used. Tape and seal all joints with approved pressure-sensitive or waterproof tape. Submit a catalog cut or other information for the vapor barrier from the manufacturer to the PGC for review and approval before ordering any materials.

6.3 - PROCEDURE

Prepare the #2A coarse aggregate subbase for the concrete floor slab according to the requirements of Section 5 of these Technical Specifications. Smooth the top surface of the stone subbase to lessen the chance of puncturing the vapor barrier. Install rigid foam insulation panels along the exterior edges of the floor slab. Place the vapor barrier on top of the stone subbase and under the insulation panels. Smooth and stretch the vapor barrier so there are no folds or creases. Make sure that the vapor barrier extends to the splash boards along all four sides of the concrete floor slab.

Cut the vapor barrier around the trench drains and pipes. Use pressure-sensitive or waterproof tape along seams in the vapor barrier and around trench drains. Repair or replace any damaged or punctured sections in the vapor barrier.

6.4 – MEASUREMENT AND PAYMENT

Square yards. No separate measurement or payment for vapor barrier used to repair cuts or holes.

TECHNICAL SPECIFICATION SECTION NO. 7 – CONCRETE

7.1 - SCOPE

This work is furnishing all materials, plant, and equipment, and performing all labor for the manufacture, transporting, placing, finishing, patching, curing, and testing of concrete to be placed under the Contract. Concrete is to be used for the pole footings and the floor slabs of the new building. Concrete slabs are to be constructed for the rear doorway and front apron. The Contractor shall protect all concrete against injury until final inspection and acceptance by the Game Commission.

Except as herein qualified, matters pertaining to measuring, placing and testing of concrete; materials used; construction of formwork; concrete finishing; curing of concrete; detailing, fabricating and placing of reinforcing and accessories shall be governed by the following codes and regulations:

- (a) Building Code Requirements for Reinforced Concrete (ACI 318)
- b) Current "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315)
- (c) Current "Recommended Practice for Measuring, Mixing, and Placing Concrete" (ACI 304)
- (d) All matters in connection with concrete work, not otherwise specified, shall conform to the applicable sections of the Pennsylvania Department of Transportation Specification Publication 408.

7.2 - TESTING AND CERTIFICATIONS

Obtain all concrete from a PennDOT approved source. Submit a concrete mix design for each supplier to the Game Commission for approval 3 days prior to placing concrete.

One set of four (4) standard test cylinders for each day's pour shall be taken and forwarded to an approved laboratory for testing. Two (2) cylinders shall be tested at the age of seven (7) days and two (2) cylinders tested at the age of twenty-eight (28) days. Three (3) copies of tabulated results of such tests shall be forwarded to the Game Commission for approval and distribution. All costs in connection with tests of concrete shall be borne by the Contractor.

Provide product information, and/or original certifications for the following items: cement, admixtures, aggregates, preformed expansion joint filler, epoxy bonding compound, joint seal material, and curing compound.

7.3 - COMPOSITION

Concrete shall be composed of Portland cement, water, fine and coarse aggregates and approved admixtures, all well mixed and brought to the proper consistency.

1. Concrete shall be Class A and shall develop a minimum compressive strength of 3,300 psi in twenty-eight (28) days.
2. Concrete shall be obtained from a batch plant currently approved by the Pennsylvania Department of Transportation (PennDOT) or the Department.
3. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM Designation C94.

7.4 - MATERIALS

All materials shall be obtained from sources listed in PennDOT Bulletin 14 or PennDOT Bulletin 15 as applicable.

A. Cement - Cement shall be one of the following types:

- (1) Normal Strength Air-Entraining Portland Cement, Type IA or Type IIA, conforming to ASTM Designation C150.
- (2) Normal Strength Air-Entraining Portland Blast Furnace Slag Cement, Type IS-A, conforming to ASTM Designation C595.

B. Admixtures - Approved types of admixtures meeting ASTM Designation C260, increasing the plasticity and workability of the concrete may be used.

C. Water - Water for concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.

D. Aggregates - Aggregates for concrete of normal weight shall conform to "Specifications for Concrete Aggregates" (ASTM C33).

E. Preformed Expansion Joint Filler - Preformed expansion joint filler shall be of the size shown on the Drawings, shall be gray in color, and shall conform with the requirements of AASHTO M153, Type 1, sponge rubber. Joint filler shall be solid sponge rubber, and no reprocessed material will be accepted. Joint filler made of numerous pieces of sponge rubber which adhere to each other will not be acceptable. The material shall be stored as recommended by the manufacturer.

F. Joint Seal Material - The joint seal material shall conform with the requirements of ASTM C290 such as Sikaflex-2c or Sikadur 51 as manufactured by the Sika Corporation,

Lyndhurst, New Jersey or an approved equal. The material shall be stored as recommended by the manufacturer.

G. Curing Compound - The curing compound shall be clear or translucent containing a red fugitive dye conforming to the requirements of AASHTO M148, Type 1-D, and must not affect water in any respect to injure fish life or impair or be detrimental to water for human consumption. The curing compound shall be stored as recommended by the manufacturer.

7.5 – PREPARATION OF AREAS TO RECEIVE CONCRETE

For pole footings, excavate to the proper depth and grade. Remove any organic material from the areas to receive concrete.

For concrete slabs, place and compact #2A coarse aggregate as shown on the Drawings. Place rigid foam insulation panels and vapor barrier. Install the splash boards on the outside edges of the building to act as forms.

7.6 - JOINTS AND EMBEDDED ITEMS

Place preformed expansion joint filler around the poles and in the expansion joint as shown on the Drawings. Place trench drains, drainage pipes and utility sweeps. All joint materials and embedded items shall be clean and free of dust, grit, mud, oil or grease, and shall be held firmly in place to avoid displacement during concreting.

7.7 - FORMWORK

Forms shall conform to the shapes, lines, grades, and dimensions of the concrete as called for on the Drawings. They shall be sufficiently tight to prevent leakage of mortar and shall be properly braced or tied together so as to maintain the desired position and shape during and after placing concrete. Forms shall be removed in such a manner as to assure the complete safety of the structure.

7.8 - CONCRETE PLACEMENT

A. Depositing - Concrete shall be deposited in the presence of a representative of the Game Commission.

In all cases, concrete shall be deposited as nearly as practicable in its final position and not allowed to flow in a manner to permit or cause segregation and loss of slump. Once concreting is started, the operation shall be carried on continuously until the placing of the panel or section is completed. Concrete shall be placed in continuous, approximately horizontal layers, the depths of which generally shall not exceed twenty (20) inches.

All conveying equipment shall be of such size and design as to insure a practically continuous flow of concrete at the forms. Free falls of more than four (4) feet are not permitted.

Any concrete that has been contaminated by foreign matter or which has become so stiff that proper placing can not be assured, shall be wasted.

If unfavorable weather conditions exist, the Game Commission may order the work stopped, either before concreting has started or after it is in progress, until a suitable formwork or covering is set up on the site to protect fresh concrete from rain, hail, snow, or other unfavorable conditions.

B. Consolidation - Concrete shall be consolidated by vibration so that concrete is thoroughly worked around the reinforcement, around embedded items, and into corner of forms, eliminating all air or stone pockets which may cause honey-combing, pitting, or planes of weakness. Internal vibrators shall be of the largest size and the most powerful that can be properly used in the work, as described in Table 5.1.4 of ACI 309, and they shall be operated by competent workers. Vibrators shall not be used to transport concrete within the forms and shall not be attached to the reinforcing bars to consolidate concrete. Vibrators shall be inserted and withdrawn at points approximately eighteen (18) inches apart. At each insertion, the duration shall generally be between five (5) and fifteen (15) seconds, sufficient to consolidate concrete, but not sufficient to cause segregation. A spare vibrator shall be kept at the job site during all concrete placing operations. Before continuing the placement operations, any displacement of reinforcement, forms, or embedded items as a result of placement or vibration shall be corrected. Concrete which has been segregated by overvibration shall be removed and discarded. Proper care shall be used to insure that the vibrators does not penetrate or disturb layers which have partially hardened. If directed by the Game Commission, exposed form surfaces shall be spaded in addition to vibration to minimize bubbles in concrete surface.

7.9 - REMOVAL OF FORMS AND REPAIR OF CONCRETE

A. Removal of Forms - Forms shall be removed as soon as practicable to avoid delay in curing and also to enable earliest repair of surface imperfections. The time of form removal shall be based on the effect on the concrete; there shall be no damage to the concrete, due either to the removal of support or to the form stripping operation. Forms shall be carefully removed so as to avoid injury to the concrete, and satisfactorily repair any concrete so damaged. Forms shall not be removed until twenty-four (24) hours has elapsed from concrete placement except when specifically authorized by the Game Commission. During cold weather, forms shall be kept in place for five (5) days, unless otherwise authorized by the Game Commission. The Contractor shall accept full responsibility for any damage to concrete incurred by stripping too early.

B. Repair of Concrete - Repair of concrete shall be performed by skilled workers and in the presence of a representative of the Game Commission. Repairs shall be completed within 48 hours after removal of forms. When directed by the Game Commission, the

Contractor shall repair or remove and replace any concrete that does not meet the requirements of any portion of this Technical Specification. Any concrete which is not satisfactorily repaired shall be removed and replaced.

7.10 - TOLERANCES

The concrete surfaces and reinforcing steel shall conform to the tolerance limits listed in the following tables. Permissible surface irregularities for the various classes of concrete surface finish as specified in "Finishing Concrete" section of these specifications are defined as "Finishes," and are to be distinguished from tolerances as described herein. The Contractor shall establish and maintain, in an undisturbed condition and until final completion and acceptance of the Project, sufficient control points and benchmarks to be used for reference purposes to check tolerances. Concrete work that exceeds the tolerance limits specified shall be satisfactorily remedied or removed and replaced by and at the expense of the Contractor.

CONCRETE TOLERANCES		
Variation from established lines	Change in 10 feet Maximum permissible	1/4 inch 1 inch
Variation from the plumb in lines and surfaces	In 10 feet In 20 feet In 40 feet	1/4 inch 3/8 inch 3/4 inch
Variation from the level or from the grades indicated on the Drawings for top of walls	In 10 feet In 20 feet In 40 feet	1/4 inch 3/8 inch 3/4 inch
Variation in thickness of slabs and walls	Minus Plus (Walls) Plus (Slabs)	1/4 inch 1/2 inch No limit
Footings:		
(1) Variation of dimensions in Plan	Minus Plus	1/2 inch 2 inches
(2) Misplacement or Eccentricity	Not more than	2 inches
(3) Reduction in thickness	Minus	5% of thickness

NOTE: No abrupt changes in line, grade or dimension will be permitted for any of the conditions listed above. Variations in thickness will be permitted only as "spot" conditions and shall not extend over large areas.

Reinforcement steel shall be fabricated in accordance with the fabricating tolerances given in ACI 315 and shall be placed conforming to the tolerance limits listed in the following table:

REINFORCEMENT STEEL TOLERANCES		
Variation for Protective Covering	With 2-inch cover With 3-inch cover	1/4 inch 1/2 inch
Variation from indicated spacing for individual bar		1/2 inch
Variation from lap	Minus Plus	0 inch No limit

7.11 - FINISHING CONCRETE

A. General - Allowable deviations from plumb or level and from alignment, grades, and dimensions shown on the Drawings and as specified in Section 7.10 are defined as "tolerances," and are to be distinguished from finishes as described herein. Finishing shall be completed immediately after removing the forms.

B. Formed Surfaces - All formed concrete surfaces shall be treated as described below by a skilled concrete finisher.

Holes shall be filled and defective areas repaired immediately after form removal. Fins and irregularities shall be removed or corrected. There shall be no conspicuous offsets, bulges or misalignment of concrete.

C. Unformed Surfaces - All unformed surfaces shall be finished in accordance with the following requirements by a skilled concrete finisher:

Immediately after vibration is completed, the surface shall be leveled and screeded sufficiently to produce an even, uniform texture.

Floating shall be done by hand or power-driven equipment. Floating shall not start until some stiffening has taken place in the surface concrete and the moisture film or "shine" has disappeared. The floating should work the concrete no more than necessary to produce a surface that is uniform in texture and free of screed marks. Any necessary cutting or filling of surface to prevent irregularities should be done during the floating operations. Joints and edges shall be finished with edging tools at this time.

After floating is completed, apply a light steel trowel finish to the top surface of the floor slab concrete. Light surface pitting and light trowel marks are not objectionable. For the doorway ramps and front apron slab; apply a light broom finish for traction.

7.12 - CURING AND PROTECTION

A. General - After finishing operations are completed, the concrete shall be membrane cured. A minimum of seven (7) consecutive days of curing and protection shall be required. The following definitions of air temperature and curing temperature are specified below, as they will be mentioned frequently in this section:

Air Temperature - The measured temperature in the shade, not in the direct rays of the sun, and away from artificial heat.

Curing Temperature - The temperature of the air immediately adjacent to concrete. Where concrete is not covered by forms or other protective coverings, or where protective coverings are considered inadequate, the curing temperature will be considered as being not more than the air temperature. During cold weather, the curing temperature is the temperature inside the forms, protective coverings or housings. The curing temperature for the first 24-hour period after placing concrete will be considered as not more than the temperature of the concrete at the time of its placement in the forms.

B. Insulation - High-low thermometers shall be provided and an accurate daily record of air and curing temperatures maintained during cold weather. These temperatures shall be submitted daily to the Game Commission. Curing temperatures shall be taken on the surface of the concrete and at representative locations on structures.

Adequate care shall be provided so that at any time during the curing period the curing temperature does not fall below 50°F. Any day during which the curing temperature drops below 50°F but remains above 35°F, will not be considered as day as a curing day and the duration of the curing period shall be extended accordingly. If at any time during the curing period, the curing temperature falls below 35°F, the contractor shall core and test the concrete at his own expense. The concrete shall be considered satisfactory and acceptable if the strength and durability requirements of Section 7.3.1 are met.

In moderate weather, when the forecasted air temperature is expected to be between 35°F and 50°F, in addition to membrane curing, insulated blankets shall be furnished and placed over concrete and forms.

During cold weather, when the forecasted air temperature is expected to be 35°F or lower, cure shall be by the methods prescribed for curing in moderate weather, and in addition, furnish and install canvas covered frames or some type of approved housing that will completely enclose the fresh concrete and forms. Also sufficient approved heating apparatus (preferably steam equipment) shall be furnished to maintain the temperature of air surrounding the fresh concrete between 50°F and 80°F, for seven (7) days. Concrete covers shall be kept moist during the curing period. After seven (7) days, the temperature shall gradually be lowered within the housing to the outside temperature over a period of 72 hours. When heating apparatus is required, special care shall be provided to prevent the concrete from drying. Combustion heaters shall not be used during the first 24 hours

unless adequate precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide. Arrangements shall be made for heating, covering, insulating, or housing the concrete work, in advance of placement, and they shall be adequate to maintain the required temperature without injury to the concrete due to concentration of heat.

Changes in air temperature immediately adjacent to the concrete during and immediately following the curing period shall be kept as uniform as possible, not exceeding five (5) degrees Fahrenheit in any one (1) hour or 50°F in any 24 hour period.

C. Membrane Curing - Finishing of the concrete surfaces shall be completed prior to the application of curing compound.

Curing compound shall be applied in two (2) coats, each coat covering 300 square feet of concrete surface per gallon. A pressure tank type spraying equipment shall be used, which shall provide continuous agitation of the compound during coating operations. Do not use ordinary orchard-type hand sprays. In order to insure thorough and complete coverage of the concrete surfaces, the first coat shall be applied by moving the spray gun back and forth in one direction, and the second coat immediately thereafter by moving the spray gun at right angles to the direction of the first coat.

The first coat shall be applied immediately after finishing operations are completed. The second coat shall be applied immediately after the first coat has set.

D. Protection - All concrete shall be protected against injury until final inspection and acceptance by the Game Commission.

During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials or methods, by application of curing procedures, and by rain or running water.

Until final inspection and acceptance by the Game Commission, the Contractor shall repair, or remove and replace any damaged concrete at no additional cost to the Game Commission.

7.13 - MEASUREMENT AND PAYMENT

Measurement will be in cubic yards, measured by the average end area method or by the three dimensional volume method, as applicable.

Payment will be made at the unit price per cubic yard bid for "Concrete", which price shall include the furnishing of concrete, forms, all labor and equipment for mixing, placing, curing, finishing, repairing and forming; all laboratory and field tests, including the furnishing of test equipment as required and all labor, materials, and appurtenances necessary to do and complete the work.

TECHNICAL SPECIFICATION SECTION NO. 8 – FOUNDATION, FLOOR AND TRENCH DRAINS

8.1 - SCOPE

This work is providing and installing the trench drains, floor drain, pipe and pipe fittings to form the floor drainage system as shown on the Drawings.

8.2 – MATERIALS

A. Solid Plastic Pipe –The solid plastic pipes used for the floor drainage system shall be Schedule 40 conforming to the requirements of ASTM D1785.

B. Plastic Pipe Fittings – Plastic couplings, tees, end caps and elbows shall conform to the requirements of ASTM D3034.

C. Trench Drains – The trench drain in the heated bay shall be 48” long NDS Dura Slope DS-091 or an approved equal with the following characteristics and features:

1. Manufactured from molded structural foam polyethylene capable of supporting loads up to 175 psi.
2. Flow path is 4-inches (minimum width).
3. Flow path has 0.7% slope with bottom outlet on one side of the trench.
4. Equipped with black polyolefin grating w/stainless steel screws.
5. End of trench drain equipped with end caps.

The trench drain in the unheated bays shall be a 10” x 24’ drain that can be pre molded or site built.

D. Floor Drain – The floor drain in the mechanical room shall be a 3-inch PVC general purpose floor drain equipped with a 4-inch removable stainless steel strainer such as an Oatey Model #43579.

8.3 - SUBMITTALS

Submit a catalog cut or other information for the perforated plastic pipe, solid plastic pipe, pipe fittings, trench drains and floor drain from the manufacturers to the PGC for review and approval before ordering any materials.

8.4 - PROCEDURE

Mark the alignment of the drainage pipes and trench drains under the floor of the building and outside the building. Extend the alignment so that the pipe outlets to daylight towards positive drainage. Excavate the trench according to the dimensions shown on the Drawings for the pipes and according to the trench drain manufacturer. The trench depth will vary with the existing ground level and the slope of the pipe. The pipes shall be sloped at a minimum ¼-inch per foot. Install the solid drainage pipe in the trench and backfill with AASHTO #10 stone. Place slotted end caps on

the outlet ends of the drain pipes. Complete backfilling of the trench with excavated material outside the building and #2A coarse aggregate under the floor of the building.

Excavate the trench drain areas as recommended by the manufacturer so the units can be surrounded by at least 4-inches of concrete. The top of the trench drains are to be below the finished surface of the concrete floor to properly drain. Protect the trench drains during concrete placement so that concrete does not enter the units. Secure the trench drains so that they are not displaced during concrete operations. Use essentially the same procedure for installing the floor drain in the mechanical room.

Joining pipe sections and installation procedures for plastic pipes shall conform to the requirements of ASTM D2321.

8.5 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 9 – FRAMING LUMBER AND CARPENTRY

9.1 - SCOPE

This work is providing and installing the lumber and fasteners necessary to frame the building.

9.2 - MATERIALS

A. Dimension Lumber – The lumber used to frame the building should be of the sizes, spacing and arrangement shown on the Drawings. The lumber should conform to the following requirements.

1. Grading Agency – Southern Pine Inspection Bureau, Inc. (SPIB)
2. Nominal sizes – as indicated on the Drawings, S4S.
3. Moisture content – S-dry or MC19
4. Structural Grade – No. 2

B. Treated Lumber – Same as dimension lumber plus treatment by ACQ (waterborne preservative), 0.4 pcf retention in conformance with the American Wood Preservers Association (AWPA). Use category UC2 for interior construction not in contact with the ground, use category UC3b for exterior construction not in contact with the ground and use category UC4a for items in contact with the ground.

C. Plywood – Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559. The plywood shall have at least 2,600 psi extreme fiber stress in bending. Plywood for the heated/unheated wall to be good one side.

D. Wood Posts – The wood posts can be dimensional treated posts or glue laminated columns manufactured from #1 Southern Yellow Pine with the lower portions pressure treated to 0.60 pcf with CCA in compliance with AWPA C28. The pressure treated portion of the wood posts shall extend at least one foot above the finished concrete floor elevation.

E. Fasteners – Of the sizes and type suited for the applications. Where rough carpentry is exposed to weather, in ground contact, in pressure-treated lumber, or in the area of high relative high humidity, provide fasteners of Type 304 stainless steel.

1. Nails, Brads and Staples: ASTM F1667
2. Power-Driven Fasteners: NES NER-272
3. Wood Screws: ASME B18.6.1
4. Lag Bolts: ASME B18.2.1(ASME B18.2.3.8M)
5. Bolts: Steel bolts complying with ASTM A307, Grade A (ASTM F568M, Property Class 4.6); with ASTM A563 hex nuts /washers where indicated.

6. Expansion Anchors: Anchor bolt and sleeve assembly made with carbon-steel components, zinc plated to comply with ASTM B633, Class FE/Zn 5.

9.3 - PROCEDURE

Construct the building frame according to the dimensions and layout shown on the Drawings. Excavate holes for the wood posts and place concrete in the bottom of the holes as shown on the Drawings to prepare for post installation. Install truss seats, girts and corner braces as shown. Provide extra framing lumber around doors and windows to provide the support necessary to install these items. All exterior wall sections that will be finished with OSB board and FRP panels are to be framed with 2' x 6' studs on 16-inch centers. Base plates for these walls must be pressure treated. Provide temporary bracing for the building frame to maintain the integrity of the building as construction progresses.

Frame interior wall sections with 2' x 4' studs on 16-inch centers to receive the OSB board and FRP panels. The base plates for interior walls must be pressure treated. Drill holes in the wall base plates (treated 2"x4") for expansion anchors or use power actuated gun to secure completed wall panels to the concrete floor.

After construction is complete, remove all temporary bracing and waste lumber from the site.

9.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 10 – ROOF TRUSSES

10.1 - SCOPE

This work is providing and installing the wooden roof trusses for the new building as shown on the Drawings.

10.2 – TRUSS DESIGN

A. General Dimensions and Features – The trusses have a 4:12 pitch and 2-foot overhangs @ the eaves and 1-foot on the gable ends. The trusses shall have a 40-foot span and are spaced on 4-foot centers. *Trusses must include an 8-inch energy heel in the truss design.*

B. Design Loading – The roof trusses must have a roof load rating of 42.5 lbs/ SF ground snow load (snow load factor of 0.7) and a wind load rating of 25 lbs/SF.

C. Design Drawings and Calculations – The design drawings and calculations for the trusses must be sealed and certified by a licensed professional engineer (valid Pennsylvania license). The drawings must be submitted for review by the PGC. The truss design shall conform with the applicable provisions of “National Design Specification for Stress-Grade Lumber and Its Fastenings” (National Forest Products Association) and “Design Specifications for Light Metal Plate Connected Wood Trusses”(TPI).

10.3 - PROCEDURE

Conform to the manufacturer’s recommendations for storing, handling, installing and bracing of the trusses. Provide adequate temporary bracing of the trusses during installation.

Provide adequate permanent bracing of the top chords, bottom chords and web members of the trusses according to the manufacturer’s recommendations. Install purlins for the roof panels on the top chord of the trusses. Secure the roof trusses to the building frame with galvanized steel hurricane ties or dimensional blocking.

After construction is complete, *provide all bracing for the roof trusses as required by the truss manufacturer.*

10.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 11 – METAL SIDING AND ROOF PANELS WITH SNOW GUARDS

11.1 - SCOPE

This work is providing and installing the metal siding and roof panels w/snow guards on the new building frame and roof trusses as shown on the Drawings. The installation of gable end louver panels is also included in this section. Snow guards may/may not be shown but must be installed in two rows staggered on the front of the building and above all doors in the back. Colors to be verified before ordering.

11.2 – MATERIALS

A. Siding and Roof Panels – The siding and roof panels shall be fabricated from galvanized steel sheet with a minimum coating of 0.90 oz/SF. The roof panels shall be minimum **26-gauge** steel sheet stock capable of supporting the design roof loading. The roof panels shall be full length from ridge to eave. The ridge and eaves shall be fitted with continuous gaskets. The finish color of the roof panels and wainscoting is GREEN. The siding panels shall be minimum **26-gauge** steel stock with the same configuration and finish as the roofing panels except the finish color is BEIGE/BROWN.

B. Trim – Steel sheet stock pre-fabricated into ridge cap, end wall flashing, gable end trim, corners, dew drip caps, door jambs trim, cut edge trim and side wall flashing. The finish color will match the application it is associated with. The window and door jambs may be WHITE. Fascia and soffit trim color shall be GREEN.

C. Sealants and Fasteners – Manufacturer’s standard type exterior sealants and gaskets, ring shank nail fasteners w/neoprene washers, galvanized to ASTM A153, finished to match exposed siding. Screw fasteners, cadmium plated self-tapping, hex head with washer and soft neoprene sealing ring finished to match metal roof surface.

D. Snow Guards – The snow guards are to be “Snow Defender 4500” w/16-gauge Type 304 Stainless Steel and EPDM Rubber Sealer.

11.3 - PROCEDURE

The roofing and siding panels are to be sized to the proper dimensions for installation. Install the roofing and siding panels with the recommended spacing and type of fasteners. The Contractor is responsible for the correct spacing of the purlins and girts to support the roof and siding panels. Siding panels are to be installed with the corrugations running vertically. Cut “custom” panels at the site for gable ends if necessary. The Contractor should shear or use snips to cut siding and roof panels to minimize the potential to damage the protective coatings on the panels.

Install the wainscoting and flashing for the building followed by the siding panels.

Install finish trim sections where needed on the siding and roof panels. Make sure all edges and ends are properly sealed with gaskets or sealants.

After construction is complete, remove all waste pieces of roof and siding panels, trim and fasteners from the site.

11.4 - MEASUREMENT AND PAYMENT

Lump Sum. No separate measurement or payment for the louver panels.

TECHNICAL SPECIFICATION SECTION NO. 12 – SOFFITS AND FASCIA

12.1 - SCOPE

This work is providing and installing the soffits and fascia at the roof overhangs for the new building as shown on the Drawings.

12.2 – MATERIALS

A. Soffits – The soffits shall be preformed, prepainted aluminum alloy (minimum 0.019 inch thick sheet stock) formed to a V-groove section, fully perforated surface and finish color Green.

B. Fascia – Fascia shall be preformed, prepainted aluminum alloy (minimum 0.019 inch thick sheet stock) with plain surface and finish color Green.

C. Nails – Aluminum; use prefinished nails for soffits and fascia.

D. Trim – Trim to match the same color as the material being finished.

E. Sealant – Silicone, single component, solvent curing, clear in color.

12.3 - PROCEDURE

Install F-channel to receive soffit sections and nail to fascia to secure. Install fascia and trim sections with sealant as needed.

12.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 13 – INSULATION

13.1 - SCOPE

This work is providing and installing the insulation in the walls and ceiling of the new building and under the edges of the floor slab as shown on the Drawings.

13.2 – MATERIALS

A. Fiberglass Blankets - The insulation for the walls and the ceiling (heated spaces) shall be Kraft-faced formaldehyde-free, fiber glass insulation conforming to ASTM C665, Type II (non-reflective faced), Class C, Category 1. Walls and between the trusses shall have R-19 insulation. The insulation for the ceiling above the faced insulation (between trusses) shall be R-30, formaldehyde-free, fiberglass insulation conforming to ASTM C665, Type I (unfaced). Insulation can be in batts or rolls.

B. Rigid Foam Panels – The insulation panels to be installed under the floor slab shall be rigid foam (extruded polystyrene) panels conforming to ICC ES 96-24 and ASTM C578. The panels to be installed under the edges of the floor slab shall be 2 inches thick R-10 and the panels to be installed along the vertical edges of the floor slab shall be 1/2 –inch thick.

C. Building Envelope Insulation – The insulation to be installed on the exterior envelope of the building shall be Prodex Total 48-inch insulation or an approved equal conforming to the following characteristics;

1. Blanket structure – 5 layers, aluminum foil, polyethylene backing, closed cell polyethylene foam, polyethylene backing, aluminum foil
2. Nominal thickness – 13/64-inches (5mm)
3. Perm Rating – Less than 0.1 according to ASTM E96
4. Noise reduction – 19dba impact noise (IRAM 4063)
5. Flame Spread Index – 25 or less (ASTM E84-10)
6. Smoke Developed Index – 45 or less (ASTM E84-10)
7. Insulating Value – R-14

This foil faced insulation shall also be installed on top of the roof purlins and below the metal roofing of the building. *House wrap is to be installed on the exterior girts of the heated walls.*

D. Attic Rafter Vents – The attic rafter vents shall be extruded pre-formed polystyrene designed to fit between the roof framing members to provide cross ventilation between insulated attic spaces and vented eaves.

13.3 - PROCEDURE

Fiberglass insulation is to be installed in the walls and ceilings of the heated areas only. Store insulation materials indoors before installation. Keep insulation clean and dry. When transporting, cover with a waterproof tarpaulin as necessary.

Install attic rafter vents properly against the underside of the roof deck, between the roof trusses. Install insulation as directed by manufacturer.

Open insulation packages and be careful to avoid cutting the product or facing. Gently push the insulation into the wall and ceiling cavities. Install the insulation so that the Kraft-facing is toward the interior of the building. Secure the flanges of the facing to the studs or roof truss chords. Take care not to stretch the insulation which could cause the material to compress or tear. Space the staples at least six inches from each end of the batt and 12" to 24" apart. Cut insulation as necessary to fit around framing for doors, vents and fans.

Install the R-19 ceiling insulation between the bottom chord of the trusses with the vapor barrier facing down. Install the R-30 unfaced insulation across (perpendicular) the R-19 insulation and truss chords.

Install the building envelope insulation (Prodex) over the outside face of the wood wall girts in the unheated bays. House wrap is to be installed on the exterior of the heated walls. Cut the building envelope materials neatly around doors and windows. Seal all seams and around doors and windows with a vapor retarder tape. Conform to the manufacturer's recommendations for installation to avoid damage to the material. The building envelope insulation Prodex shall also be installed in the building on top of the roof purlins and below the metal roofing of the building.

Place rigid foam panels under the edges of the floor slab as shown on the drawings. The panels should extend 4-feet in from the perimeter of the building. Install ½-inch thick panels vertically at the splashboards on the edges of the concrete floor along the perimeter of the heated areas of the building.

13.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 14 – DROP CEILING

14.1 - SCOPE

This work is providing and installing the acoustical panels and metal suspension system to form the drop ceiling in the new building as shown on the Drawings. A drop ceiling is to be installed in the office, bathroom and mechanical room only. The heated shop area is to have a gypsum board ceiling.

14.2 – MATERIALS

A. Acoustical Panels – The acoustical panels shall have a Class A fire rating and shall be white with a random medium or fine texture. Provide a 24 inches x 48 inches x 5/8 inch thick panel from Armstrong World Industries, or a comparable equal product. The edge detail of the panels is square. The panels must be mold, mildew and bacteria resistant.

B. Hanger Rods – Mild steel, zinc coated or protected with rust-inhibitive paint.

C. Metal Suspension System – Armstrong World Industries standard 15/16 inch metal suspension system or comparable product from USG Interiors, Inc. or Chicago Metallic Corporation. The finish color of the metal suspension system is white.

D. Metal Edge Moldings and Trim – Armstrong World Industries or comparable product by USG Interiors, inc. or Chicago Metallic Corporation.

14.3 - PROCEDURE

Examine the substrates, areas and conditions to which the drop ceiling components will attach or abut to see if there are problems with installing the drop ceiling. Correct those problems before installing the drop ceiling components. Examine acoustical panels before installation. Reject acoustical tiles that are wet, moisture damaged or mold damaged.

Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders and comply with the layout shown on the Drawings.

Install acoustical panels in compliance ASTM C636 and according to the manufacturer's recommendations.

Install hangers where required plumb and free from contact of other objects within the ceiling plenum. Install supplemental suspension members or hangers in the form of trapezes or equivalent devices. Secure wire hangers to ceiling suspension members and to supports above. Connect hangers directly to structures or to inserts, eye screws, or other devices that are secure and appropriate for each substrate and

that will not deteriorate or otherwise fail due to age, corrosion or elevated temperatures. Space hangers not more than 48 inches on center along each member supported directly from hangers and not more than 8 inches from the ends of each member. Install edge moldings and trim of type indicated at the perimeter of the drop ceiling areas and where necessary to conceal edges of the acoustical panels. Attach moldings to substrates at intervals not more than 16 inches on center and not more than 3 inches from the ends. Level the ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely. Do not expose fasteners, including pop rivets on moldings or trim.

Install suspension system runners so that they are securely interlocked with one another. Remove and replace dented, bent or kinked members.

Clean exposed surfaces of acoustical panels, trim and edge moldings. Comply with the manufacturer's recommendations for cleaning and touchup of minor finish damage. Remove and replace panels and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

14.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 15 – WINDOWS

15.1 - SCOPE

This work is providing and installing the windows in the building.

15.2 – MATERIALS

The windows shall be American Craftsman Series 3000 double-hung vinyl windows. Other manufacturers are acceptable provided that the windows have the following features and requirements. The windows shall be nominal size 2'-6" wide x 3'-0" high (6) and 2'-0" wide x 3'-0" high (1) with LowE3 insulated glass with argon gas.

1. Energy Star compliant.
2. Top and bottom sash tilt in for easy cleaning.
3. Fusion welded vinyl frame and sashes.
4. Dual weather stripping.
5. Integral J-channel for easy trimming of exterior siding.
6. Colonial brickmold design.
7. Insect screen.
8. Frame finish is white vinyl.

15.3 – SUBMITTALS

Submit a catalog cut or other information for each type of window and the shutters from the manufacturers to the PGC for review and approval before ordering any materials.

15.4 - PROCEDURE

Install the windows according to the manufacturer's instructions. Install additional framing lumber as required to safely support the window openings in the framing of the building walls. Install the windows in the blocked and framed openings and secure them according to the manufacturer's instructions. Caulk or insulate around the installed windows to provide a weather-tight seal. Install any trim pieces on the interior or exterior as required. Test the operation of the windows and make adjustments if necessary.

15.5 - MEASUREMENT AND PAYMENT

Each. No separate measurement or payment for additional framing lumber and carpentry, caulking, or trim as required to install and finish the windows.

TECHNICAL SPECIFICATION SECTION NO. 16 – DOORS

16.1 - SCOPE

This work is providing and installing the man doors and garage doors in the new building as shown on the Drawings. Doors are expected to have the necessary thresholds and/or weather-stripping/caulk as needed to provide for a tight seal.

16.2– MATERIALS

A. General – Refer to the door schedule on the drawings for details of hinge and swing requirements, sizes and lockset hardware. All locks (interior and exterior) are to be keyed alike. Manufacturers are quoted for hardware, locksets, gaskets, closers, etc. for the doors to set standards for performance and finish; other manufacturers are acceptable provided that their products are the same level of quality.

B. Insulated Doors - The insulated doors in the new building shall have the following features and characteristics. These doors are listed as Type A or Type E on the door schedule. The insulated doors shall be supplied with vertical narrow lights except on the exterior doors. Ceco Door Products Medallion Series conform to the following specification but other manufacturers are acceptable.

1. Entry doors are galvanized 18 gage steel flush 3'-0" x 7'-0" panel w/insulated core conforming to ANSI A250.8-03
2. Pre-hung units with galvanized 16 gage (minimum) steel double rabbet frame (knock down)
3. Factory applied baked on primer with a factory or field applied white enamel finish coat on door and frame applied according to the manufacturer's instructions
4. Doors are 1-3/4" thick
5. Equipped with Corbin Russwin ED5200 panic bar hardware, TH957 device trim and handle with 630 satin stainless steel finish
6. Satin finish stainless steel hinges
7. Equipped with Norton CPS-750-T door closer with 693 black finish
8. Equipped with Rockwood K1050 (10"x34") kick plates (one side) with 630 satin stainless steel finish
9. Equipped with weather tight gaskets
10. Equipped with aluminum mill finish threshold
11. Equipped with National Guard Products C607DKB nylon brush seal.
12. Stanley Best Access products 1E72 rim cylinder with 613 satin stainless steel finish (**keys and core types per PGC**)

C. Non-insulated Doors – The non-insulated interior doors in the new building shall have the following features and characteristics. These doors are listed as Type B, C and D on the door schedule. These doors shall be flush panel. Ceco Door Products Regent

Series conforming to the following specification but other manufacturers are acceptable.

1. Passage doors are galvanized 20 gage steel flush 3'-0" x 7'-0" panel 1-3/4" thick full flush with honeycomb core
2. Pre-hung units with galvanized 16 gage (minimum) steel double rabbet frame
3. Impact resistant, full honeycomb core with a min. crush strength of 45 psi
4. Seamless edges with 7 gage steel hinge reinforcement.
5. Satin finish stainless steel hinges
6. Stanley Best Access Systems 93K-7D14C lockset with 613 satin stainless steel finish for the bathroom door
7. Stanley Best Access Systems 93K-ON14C passage set with 613 satin stainless steel finish for offices and mechanical room doors
8. Equipped with kick plates (one side) and concave wall stop with 630 satin stainless steel finish

D. Garage Doors – The garage doors in the new building shall have the following features and characteristics (or equal to).

1. "Wayne Dalton" Commercial 12'x 12' doors w/R17.5 insulated core
2. Model 200
3. Factory applied primer with white finish coat on door
4. Torsion spring
5. Lock included
6. Equipped with two 26' x 13" double insulated acrylic windows with black frames
7. Professional installation by manufacturer's representative

16.3 – SUBMITTALS

Submit a catalog cut and other information for the man doors, garage doors and accessories from the manufacturers to the PGC for review and approval before ordering any materials.

16.4 - PROCEDURE

Install the steel entry doors and frames according to the manufacturer's instructions. All steel surfaces of the doors and frames are to be factory primed and a factory or field painted finish. The finish coat of the steel doors and frames shall be a white outdoor grade enamel. The garage door tracks, torsion springs and garage doors are to be installed by a manufacturer's representative.

16.5 - MEASUREMENT AND PAYMENT

Each according to the type of door as listed on the Proposal Form. No separate measurement or payment for the frames, accessories, door hardware and keys.

TECHNICAL SPECIFICATION SECTION NO. 17 – HEATING SYSTEM AND DUCTWORK *Separation of Contract, to be awarded separate*

17.1 - SCOPE

This work is providing and installing the heat pump, air handler, ductwork, registers and grilles that make up the new building's heating system.

17.2 – MATERIALS

A. Heat Pump and Air Handler – Goodman DSZC16 or an approved equal with the following characteristics.

1. 4-ton, 2-stage air-to-air heat pump system
2. All materials and workmanship to be guaranteed for one year from date of installation. Manufacturer's 5-year warranty on functional parts & compressor.
3. Minimum 16 SEER and 9.5 HSPF
4. Variable speed blower motor
5. 15kW minimum emergency backup staged electric heat strips
6. Outdoor unit is to be equipped with snow legs
7. Outdoor unit is to be installed on composite, formed or precast concrete pad

B. Thermostat – Goodman ComfortNet CTKO3 or an approved equal.

C. Ductwork – To be sized and installed from the requirements and procedures of SMACNA. Ductwork to meet or exceed UCC code requirements. All supply ducts to be insulated as per code.

D. Hanger Rods and Supports – Cadmium plated steel rods and nuts.

E. Grills and Registers – Steel with baked white enamel finish.

17.3 - PROCEDURE

Conform to the manufacturer's requirements when installing the heat pump, air handler and other components of the heating system. The drawings show the suggested size, location and layout of the ductwork and grilles/registers for each room in the building. Layout can be modified if air flows and system performance can be maintained. Mount ductwork with the applicable hardware.

Install the thermostat in the break room/office. Make the required electrical connections to operate the system. Test the HVAC system and make any necessary balance adjustments in the ductwork. Demonstrate system to PGC on site staff.

17.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 18 – LIGHTING, ELECTRIC AND SERVICE CONNECTION *Separation of Contract, to be awarded separate*

18.1 - SCOPE

This work is providing and installing the components of the lighting and electric system for the new building as shown on the Drawings. This work includes trenching for U.G. electric from existing pole or pad to new building as well as installing a 200 amp panel and installation of the telephone and data lines from the office to the mechanical room and office.

18.2 – GENERAL

The drawings are indicative of the character and scope of the electrical work and are not intended to show all the details. The actual location of all wiring, outlets and equipment shall be determined at the site. The Contractor shall install flush mount boxes and/or conduit in the heated bay on the metal wall.

All work shall be manufactured, tested and installed accordance with the National Electric Code (NEC) 2005, the International Building Code (IBC) 2009 and all applicable local codes. The Contractor shall furnish a fire underwriter's certificate of inspection covering the work installed under this specification.

18.3 – MATERIALS

A. Circuit Panel Box – The circuit panel box shall be dead front design complying with NEMA PB 1 and be circuit breaker type. Panel-board bus shall be copper with copper ground bus. The enclosure shall be NEMA PB 1, Type 1 with a surface type cabinet front, screw fastened cover with hinged door and flush lock. Finish color is standard gray enamel. Provide a 40-space minimum panel box (200-amp service) for the new building. Acceptable manufacturers are Siemens, Cutler-Hammer, Square-D or General Electric. No Homeline will be accepted.

B. Circuit Breakers – The circuit breakers are molded case circuit breakers conforming to NEMA AB 1, stab lock design. Circuit breakers must be equipped with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type SWD for lighting circuits. Do not use tandem circuit breakers. Acceptable manufacturers shall be Siemens, Cutler-Hammer, Square-D or General Electric. No Homeline will be accepted.

C. Wire – Romex type NM-B AWG #6 through #12 wire with ground. Wire must be in conduit where exposed.

D. Outlet and Junction Boxes – Metal or PVC for surface mounting only in the heated bay and outside of the building. Provide closures for unused ports and waterproof covers for outside receptacle boxes. PVC "New Work" boxes can be used in walls.

G. Outlets and Switches – Rated for 20 amps (or more if required by equipment manufacturer), 120/277 and as manufactured by Hubbell, Bryant, Arrow-Hart, GE, P&S or Leviton.

H. Lighting Fixtures – The lighting fixture schedule is shown on the drawings.

I. Bulbs – Install the maximum wattage as recommended by the lighting fixture manufacturer.

J. Conduit – **All exposed wiring shall be in conduit.** Conduit shall be Schedule 40 PVC rigid non-metallic conduit conforming to NEMA TC-2 and UL651. Conduit fittings shall conform to NEMA TC-3 and UL514b. MC cable may be used in unheated storage bay area if desired.

18.3 - PROCEDURE

The installation of every component in the electrical system must be performed according to the National Electric Code (NEC).

Mount the circuit panel box and outlet boxes for the lighting fixtures, equipment power supplies and receptacles in the locations as shown on the Drawings.

Drill holes in the lumber wall framing to run wiring as necessary to all fixtures, equipment and outlet locations. Use conduit in the heated and not heated bay areas of the building where wiring would be exposed. Secure the conduit with clamps approved by the manufacturer. Conduit must be extended and connected to all the outlet boxes. Use solvent cement for all conduit joints and connections. Pull wire through conduit without stripping insulation from the wires.

Install the light fixtures, switches and receptacles in the outlet boxes. Make the required conductor and ground connections. Install the light bulbs in the fixtures.

Trench for the electrical service from the existing building to the new building. Telephone and data lines to be installed from the office to the mechanical room.

18.4 - MEASUREMENT AND PAYMENT

The satisfactorily installed electrical system and connection will be measured as a lump sum.

TECHNICAL SPECIFICATION SECTION NO. 19 – PLUMBING

Separation of Contract, to be awarded separate

19.1 - SCOPE

This work is providing and installing the components of the water supply and drain pipe systems inside the building. Connections to the well and septic tank is also part of this contract. **The trench drains and mechanical room floor drain and piping for these drains are not part of in this contract.**

19.2 – MATERIALS, WATER SUPPLY & FITTINGS

A. Water Supply Pipe - The water supply (hot and cold) pipes can be CPVC (conforming to ASTM D2846 and NSF 61), Pex tubing (conforming to ASTM F876/F877/F2023) or type “L” copper.

B. Water Supply Fittings and Valves – CPVC conforming with ASTM D2846 and NSF 61, copper, brass or Pex fittings and valves per manufacturer.

C. Waste and Vent Pipe and Fittings – Schedule 40 PVC conforming with ASTM D1784, D1785 and D2665.

D. Pipe Cements – The solvent cement for making connections in CPVC pipes and fittings shall conform to ASTM F493. The solvent cement for making connections in PVC pipes and fittings shall conform to ASTM D2564. The primer for making connections in CPVC and PVC pipes and fittings shall conform to ASTM F656.

E. Pipe Insulation – Self sealing elastomeric sleeves conforming to ASTM C534.

F. Supply Lines to Faucets and Toilets – Flexible braided stainless steel.

G. Shower Valve and Head – Residential grade compatible with water supply piping.

H. Water Supply Service Pipe – The water supply service line from the well to the new building water supply system may be Type “K” copper, PVC approved for drinking water or HDPE pipe.

I. Trench Drains – The trench drain in the heated bay shall be 48” long NDS Dura Slope DS-091 or an approved equal. The trench drain in the unheated bays shall be a 10” x 24’ drain that can be pre-molded or site built. This drain shall have a heavy-duty steel grate capable of supporting vehicles and/or heavy equipment.

J. Floor Drain – The floor drain in the mechanical room shall be a 3-inch PVC general purpose floor drain equipped with a removable stainless steel strainer such as an Oatey Model #43579.

19.3 – MATERIALS, PLUMBING FIXTURES

A. General – Refer to the elevations and fixture legend on the drawings for the layout of the bathroom and fixture installation location. Manufacturers and model numbers of fixtures are listed below to set a standard for performance, size and finish. Other manufacturers are acceptable provided that their products are the same or better level of quality.

B. Bathroom Shower Control/Head – American Standard control & head

1. Polished chrome finish
2. Lever handle design
3. ADA compliant

C. Toilet – KOHLER Highline 2-piece Comfort Height Elongated Toilet (MFG# K-3493-RA-0) or approved equal meeting the following requirements.

1. White vitreous china construction
2. Elongated bowl and min. bowl rim height of 17” (ADA compliant)
3. Include or supply tank hardware, wax ring and elongated polypropylene finish white toilet seat
4. Pressure assist flushing system (1.4 gallon flush)
5. 12-inch rough-in

D. Grab Bars – Bradley Model 812 heavy duty stainless steel grab bars, 1-1/2” outside diameter, standard finish and concealed mounting or approved equal. There are two grab bars to be installed; the 24-inch long bars are to be mounted behind the toilet tank and alongside the toilet.

E. Paper Towel Dispenser – Bradley Model 250-15 heavy duty 22-gauge stainless steel for c-fold/multi-fold towels that is surface mounted with a tumbler lock or approved equal.

F. Toilet Tissue Dispenser – Bradley Model 508 chrome plated brass or approved equal.

G. Mirrors – Bradley Model 780 (18” x 36”) stainless steel or approved equal. There are two mirrors to be installed. One is to be installed above the sink in the bathroom and one is to be installed above the utility sink in the shop area.

H. Soap Dispenser – Bradley Model 655 20 gauge stainless steel with a 40-ounce capacity or an approved equal. May substitute a GOJO if approved by the PGC.

I. Shower Stall & Lining – One-piece gelcoated fiberglass shower with textured floor. Fiberglass Reinforced Panels with trim shall be used in area above the one-piece shower. The panels shall have a finished color white, silver, almond or ivory. Tile may be installed if desired.

J. Exhaust Fan – Nutone Model # HD80NT exhaust fan or approved equal with the following characteristics.

1. 80 CFM
2. Permanently lubricated motor, resilient motor mount to isolate vibration
3. Steel with white finish
4. UL listed and HVI certified for safe use over showers
5. Ceiling mount with galvanized steel housing.

Match the ductwork and louvered end cap to the exhaust fan capacities.

19.4 – MATERIALS, PLUMBING SINKS, CABINETS AND FAUCETS

A. General – Refer to the elevations and fixture legend on the drawings for the layout of the utility sink and cabinets. Manufacturers and model numbers of fixtures are listed below to set a standard for performance, size and finish. Other manufacturers are acceptable provided that their products are the same or better level of quality.

B. Utility Sink – Swan 23” x 23” Veritek Single Bowl Laundry Tub (MFG# MF-1F) or approved equal meeting the following requirements.

1. White, 22 gallon capacity
2. Angular steel legs

C. Utility Sink Faucet – American Standard Cadet 2-Handle Laundry Faucet (MFG# 7573.140.002) or approved equal meeting the following requirements.

1. Solid brass construction with Satin finish
2. Ceramic disk valves
3. Brass swivel spout with hose end
4. 2.2 GPM flow rate
5. ADA compliant

D. Restroom and Break room Cabinets – Kitchen Classics Hickory base and wall cabinets or approved equal w/Satin finish hardware (knobs) and adjustable shelves and meeting the following requirements and nominal sizes.

1. Base cabinets (2) - 21”W and 35”H with single door and drawer
2. Wall cabinets (2) 18”W and 30”H with single door
3. Wall cabinet (1) - 21”W and 30”H with single door

E. Break Room Faucet – American Standard Colony Soft Gooseneck Spout faucet (MFG# 4275.550.002) or approved equal meeting the following requirements.

1. Polished chrome finish
2. 4” centerset design
3. 2 handle lever design
4. Gooseneck spout (10” min. height)
5. ADA compliant

F. Break Room Sink – Kohler Staccato Stainless Steel single-basin commercial sink (Model# 3363-3-NA) meeting the following requirements.

1. Single bowl 20 inch width
2. 8-inch depth
3. Sound-absorption material applied
4. 18 gauge

G. Countertops – Granite look laminate with fully laminated edges and backsplash.

19.5 – MATERIALS, WATER HEATER

A. Water Heater – The water heater shall be an electric water heater with the following features and characteristics:

1. AO Smith 40-gallon tank, short and 240 volts
2. Dual 5,500 watt copper, stainless or titanium elements
3. Minimum 9-year warranty on the tank
4. Minimum 25 GPH recovery @ 90°F
5. Factory installed temperature/pressure relief valve
6. Adjustable thermostat

B. Drip Pan – Black plastic (polyethylene) with pre-cut side opening for 1-inch drain fitting. The diameter of the drip pan shall be at least 2-inches greater than the outside diameter of the water heater. Raise drip pan and heater with suitable blocking to aid in draining the tank.

19.6 - SUBMITTALS

Submit a catalog cut or other information for the utility sink, faucet, cabinets, light and countertops from the manufacturers to the PGC for review and approval before ordering any materials.

19.7 - PROCEDURE

Conform to the requirements of the International Plumbing Code for all work conducted under this section. Lay out supply, waste and vent pipes so that structural supports do not have to be cut or drilled through. Use applicable hangers/supports for all pipes where needed.

Install ¾-inch pipe as a branch line to the water heater and ½-inch connection for the faucets, shower and toilet. Install shut-off valves in the supply piping at the sinks and at the toilet. Install flexible stainless steel supply pipe from the shut-off valves to the faucets and toilet. Cover the hot water supply pipes with sleeve insulation.

Waste and vent pipes shall be PVC. Use 1½-inch PVC for sink drains. Use 2-inch and 3-inch pipe for vents as shown on the sewage schematic. Use 3-inch PVC for the toilet drain and 4-inch PVC for the sewer lateral drain pipe that exits from the building. Install the applicable traps, toilet flanges and other fittings connections under plumbing fixtures. Excavate outside the building to run the sewer pipe to the existing septic tank and drain field system and provide a conduit for the water supply. Excavate the trench as shown on the Drawings. The trench depth will vary with the existing ground level and the slope of the pipe. The pipes shall be sloped at a minimum ¼-inch per foot. Install the solid drainage pipe in the trench and backfill with AASHTO #10 stone. Complete backfilling of the trench with excavated material outside the building and #2A coarse aggregate under the floor of the building.

Excavate the trench drain areas as recommended by the manufacturer so the units can be surrounded by at least 6-inches of concrete. The top of the trench drains are to be below the finished elevation of the concrete floor to properly drain. Protect the trench drains during concrete placement so that concrete does not enter the units. Secure the trench drains so that they are not displaced during concrete operations. Use essentially the same procedure for installing the floor drain in the mechanical room.

19.8 - MEASUREMENT AND PAYMENT

Lump Sum.