James B. 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.

Section 1	Summary of Work
Section 2	Framing Lumber and Carpentry
Section 3	Roof Trusses
Section 4	Excavation
Section 5	Metal Siding and Roof Panels w/snow guards
Section 6	Soffits and Fascia
Section 7	Doors
Section 8	Electric Service Connection
Section 9	Lighting and Electric
Section 10	Gutters and Downspouts
Section 11	Concrete
Section 12	Aggregate & stone

DRAWINGS

The following drawings are included:

1 of 3 - Location map, Floor Plan and Elevations
2 of 3 - Framing Details
3 of 3 - Electrical Details and Site Plan

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' x 14' pole building to serve as the Pennsylvania Game Commission (PGC) maintenance storage building. The new building is in Liverpool Township, Perry County on State Game Lands #258. The project consists of constructing/framing the pole building frame, pouring a concrete floor slab, installing metal roofing and siding panels, installing radiant insulation, doors and other building appurtenances including installing the electrical service and lighting. There are no connections of any other utilities to the new building in of this project.

1.2 – WORK AREA

The work area for this project is on State Game Lands #226. The building site is located approximately .5 miles south of Rt 104 and 11/15 north of Liverpool, PA. The address is 90 Old trail Road, Liverpool, PA 17045. 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 must have prior written approval by the PGC. Requests for different working hours may be granted but requires two days advance notice.

1.4 – ACCESS TO WORK AREA

Access to the work area from Old Trail Road. The Contractor may use any available space to store equipment or materials on site but must keep the access road open to PGC vehicles.

1.5 – SITE LAYOUT AND PREPARATION

The PGC will stake out the four corners of the new building at the initial job conference for the project. The PGC will also provide a grade stake to mark the floor elevation during the initial job conference. The Contractor is responsible for any clearing, grubbing and/or excavation required for construction of the new building and installing the required utility lines. The Contractor is also responsible for the stone parking area around the new building. The stone parking area to be finished graded after the new building is substantially complete.

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. 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 NO. 2 – FRAMING LUMBER AND CARPENTRY

2.1 - SCOPE

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

2.2 - 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.

D. Wood Posts – The wood posts can be dimensional treated posts or glue laminated columns manufactured from #1 Southern Yellow Pine.

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.

2.3 - PROCEDURE

Construct the building frame according to the dimensions and layout shown on the Drawings. Install truss seats, girts and pulins as shown. Provide extra framing lumber around doors to provide the support necessary to install these items. Provide temporary bracing for the building frame to maintain the integrity of the building as construction progresses.

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

2.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 3 – ROOF TRUSSES

3.1 - SCOPE

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

3.2 – TRUSS DESIGN

A. General Dimensions and Features – The trusses have a 4:12 pitch and 2-foot overhangs. The trusses shall have a 40-foot span and are spaced on 4-foot centers. Trusses must include a spread web for light storage 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).

3.3 - 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 and the truss drawing. 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, remove all temporary bracing and waste lumber from the roof trusses.

3.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 4 - EXCAVATION

4.1- 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.

4.2 - 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. A location of spoil material is shown on the drawings.

4.3 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 5 – METAL SIDING AND ROOF PANELS WITH SNOW GUARDS

5.1 - SCOPE

This work is providing and installing the metal siding & roof panels w/snow guards on the new building frame and roof trusses as shown on the Drawings. Snow guards must be installed in two rows staggered on the front of the building and above the O.H. door in the back. Colors to be verified before ordering.

5.2 – 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.

5.3 – 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.

5.4 - MEASUREMENT AND PAYMENT

Lump Sum. No separate measurement or payment for the snow guards.

TECHNICAL SPECIFICATION SECTION NO. 6 – SOFFITS AND FASCIA

6.1 - SCOPE

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

6.2 – 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 Green color.

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

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

D. Trim – F-channel and angles of the same material and finish as soffit and fascia.

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

6.3 - PROCEDURE

Install F-channel on top wall girt before metal siding panels and trim are installed. Secure soffit sections in F-channel and nail to 2"x6" fascia on the roof edges. Install trim sections and apply sealant as necessary to the soffits and fascia.

6.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 7 – DOORS

7.1 - 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.

7.2– 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 Steel Entry Doors - The steel entry doors in the new building shall have the following features and characteristics. These doors are listed as Type 1 or Type 2 on the door schedule. The doors shall be supplied with vertical narrow lights. Ceco Door Products Medallion Series conform to the following specifications but other manufacturers are acceptable.

1. Entry doors are galvannealed 18 gage steel flush 3'-0"x 7'-0" panel w/insulated core conforming to ANSI A250.8-03
2. Pre-hung units with galvannealed 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 full flush with honeycomb core
5. Equipped with Precision 2108 x 4908A panic exit device trim and lever handle with 630 satin stainless steel finish
6. Satin finish stainless steel hinges
7. Equipped with Stanley D-4550-HCS-689-SN door closer.
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. Dormakaba Best Access products 12E72 rim cylinder with 613 satin chrome finish. Permanent cores to be Cormax Patented.
13. Cores and keys delivered directly to PA Game Commission.

C. Garage Doors – The garage doors in the new building shall have the following features and characteristics.

1. Clopay, Wayne Dalton, Overhead Door or Garaga Commercial steel 12'-0" x 12'-0" doors with min R-7 insulated cores.
2. Factory applied primer with white finish coat on door
3. Torsion spring
4. Lock included
5. Equipped with 21" x 13" (approx.) windows w/black frames (2 min)
6. Professional installation by manufacturer's representative

7.3 – SUBMITTALS

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

7.4 - 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.

7.5 - 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. 8 – ELECTRIC SERVICE CONNECTION

8.1 - SCOPE

This work is furnishing and installing the conduit, wiring and accessories on the inside and outside of the building. This work also includes connection of the 100 amp circuit panel box to the existing pole. The contractor shall make all the necessary conduit modifications to install the panel box with grounding rod in the new building. This includes all trenching to the existing panel as shown on the plan. Alternate routing is permissible with PGC approval.

8.2 – MATERIALS

A. Conduit – Conduit can be any size provide it meets the NEC and is approved by L&I. Conduit shall be Schedule 40 PVC and have securing straps where needed. Any sweep elbows to be 36" minimum.

B. Grounding Rod – 8-foot long grounding rod(s) and connecting cable

C. Conduit Bedding – AASHTO #10 stone.

8.3 - PROCEDURE

The electric power to the new building comes from the existing service pole towards the barn. Service panel wiring to be trenched from the pole to the new building.

Secure the circuit panel box to the new building frame. Make all necessary conduit connections and install and connect the panel box to a new grounding rod.

8.4 - MEASUREMENT AND PAYMENT

Lump Sum.

TECHNICAL SPECIFICATION SECTION NO. 9 – LIGHTING AND ELECTRIC

9.1 - SCOPE

This work is providing and installing the components of the lighting and electric system for the new building as shown on the Drawings. Refer to section 8 of these technical specifications for installing the electric service connection and sub panel to be installed.

9.2 – 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, switches and light fixtures shall be determined at the site. The Contractor shall investigate the structural and finish conditions affecting the work and arrange all work accordingly to insure that the electric and other building components are installed correctly.

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.

9.3 – MATERIALS

A. Circuit Panel Box – The circuit panel box is a 100-amp Square-D QOC200 model or approved box from power company.

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. Use Square-D breakers.

C. Wire – Romex type NM-B AWG #12/2 and #2,2,2,4 for service wire.

D. Outlet and Junction Boxes – PVC with threaded ports for conduit fittings and molded ears with holes for surface mounting; type FS as manufactured by Carlon. Provide cover plates for switches and receptacles.

E. 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.

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

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

H. 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.

9.3 - PROCEDURE

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

Mount the panel box, lighting fixtures and receptacles in the locations as shown on the Drawings.

Use conduit in all portions of the building. Secure the conduit to the roof trusses or other framing members 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 and switches in properly sized boxes. Make the required conductor and ground connections.

9.4 - MEASUREMENT AND PAYMENT

The electric service connection and installation of the panel box will be measured and paid for according to Section 8 of these Technical Specifications.

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

TECHNICAL SPECIFICATION SECTION NO. 10 – GUTTERS AND DOWNSPOUTS

10.1 - SCOPE

This work is providing and installing gutters and downspouts for the new building. Gutters must run the entire length of the front and back eaves of the new building. A downspout and concrete splash block must be installed at all four corners of the new building. The gutters, downspouts and splash blocks are not shown on the Drawings.

10.2 – MATERIALS

A. Gutters – Aluminum with baked on green finish. Gutter shall be seamless for the length of the roof. Gutter shall be standard 5-inch width.

B. Downspouts – Aluminum with baked on green finish and 3-inch by 4-inch cross section minimum.

C. Hangers and Brackets – K-style hidden hanger w/screw or recommended by gutter and downspout manufacturer.

D. Splashblocks – Precast concrete, approx. 24" long and 10" wide.

10.3 - PROCEDURE

Submit a catalog cut or other information for the concrete splash blocks, gutter and downspout from the manufacturer to the PGC for review and approval before ordering any materials.

Install gutters on the roof eaves of the new building. Secure the gutters to the fascia with hidden hangers. Install downspout drop sections and end caps at the ends of the roof eaves. Connect downspout sections to the gutters and run the downspout along the edge of the building to the splash blocks at ground level away from building.

10.4 - MEASUREMENT AND PAYMENT

Lump Sum for the gutters, downspouts and concrete splash blocks.

TECHNICAL SPECIFICATION SECTION NO. 11 – CONCRETE

7.1 - SCOPE

This work is furnishing all materials, plant, and equipment, and performing all labor for the manufacture, transporting, placing, finishing and curing 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 side 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 - 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.

7.3 – 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.

7.4 – 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. Install the splash boards on the outside edges of the building to act as forms. Place the vapor barrier down before placing concrete.

7.5 - 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.

7.6 - 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 over vibration 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.

7.7 - 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.

7.8 - 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.

7.9 - 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.

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.

7.10 - 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. 12 - AGGREGATE

12.1 - SCOPE

This work is providing a subbase for concrete slabs, backfilling around the completed foundation drains 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.

12.2 - 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.

12.3 - 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.

12.4 - 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 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.

12.5 - 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.