
SECTION 5
SPECIFICATIONS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 LOCATION OF THE PROJECT

- A. The project is located in Roosevelt Park in the City of Campbell. The proposed site is accessed from Melanie Valerio Olympic Drive, and the bocce court pavilion is to be erected adjacent to the existing parking lot east of the softball field.

1.2 PROJECT DESCRIPTION

- A. The bid documents contain bid forms for one (1) contract with alternates. The bidder must bid all Alternates.
- B. The project consists of the construction of a wooden bocce pavilion structure (88' x 40'), a pair of bocce courts, concrete pad, enclosed storage room, surrounding sidewalk, gutters, downspouts and storm drainage system, water service line and hose bib, light fixtures, and electrical service connection for lighting, outlets and future ceiling fans (alternate item). Other alternate items include a curtain wall system and park benches. Site work shall consist of earthwork, including excavation and embankment materials, pad preparation, subgrade compaction, and installation of perimeter storm drainage system.

1.3 SPECIFICATIONS

- A. In general, these Specifications describe the work to be performed by the various trades, other than work specifically excluded. It shall be the responsibility of the Contractor and Subcontractors to perform all work incidental to their trade, whether or not specific mention is made of each item, unless such incidentals are included under another Item.
- B. It is advised that the Contractor and all Subcontractors familiarize themselves with the contents of the complete Specifications, particularly for the trades preceding, following, related or adjacent to their work.

1.4 DRAWING SCHEDULE

- A. The work to be done under this Contract is shown on the following Drawings:

<u>Sheet No.</u>	<u>Title</u>	<u>Drawing Name</u>
01	Title Sheet	T100
02	Civil General Notes	SI-01
03	Overall Site Plan	SI-02
04	Site Plan	SI-03

05	Plans and Details	A-01
06	Elevations, Details and Notes	A-02
07	Section, Specifications and Details	A-03
08	Electrical Notes and Legend	E-01
09	Electrical Plans and Details	E-02

END OF SECTION 011100

SECTION 011419 – USE OF SITE

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor will be allowed the use of as much of the site designated for the improvements as is necessary for his operation.

1.2 USE OF STREETS

- A. During the progress of the work, the Contractor shall make ample provisions for both vehicle and pedestrian traffic on any public street and shall indemnify and save harmless the Owner from any expense whatsoever due to their operations over said streets. The Contractor shall also provide free access to all the fire hydrants, water, and gas valves located along the line of his work. Gutters and waterways must be kept open or other provisions made for the removal of storm water. Street intersections may be blocked only one-half at a time, and the Contractor shall lay and maintain temporary driveways, bridges and crossings, such as in the opinion of the Engineer are necessary to reasonably accommodate the public.
- B. In the event of the Contractor's failure to comply with these provisions, the Owner may cause the same to be done, and may deduct the cost of such work from any monies due the Contractor under this Agreement, but the performance of such work by the Owner at its instance shall serve in no way to release the Contractor from his general or particular liability for the safety of the public or the work.
- C. The Contractor shall repair at no cost to the Owner, all existing roads, parking areas, grassed areas that are damaged due to the execution of his work. The Contractor shall remove daily all mud, soil and debris that may be tracked onto existing streets, drives, or walks by his equipment or that of subcontractors or suppliers.

1.3 CLOSING STREETS TO TRAFFIC

The Contractor may, with the approval of the Engineer, close streets, or parts of streets, to vehicular traffic. The streets are to remain closed as long as the construction work or the condition of the finished work requires or as determined by the Engineer. The Engineer shall be the judge of how many streets or parts of streets it is necessary for the Contractor to close at any time, and may refuse to permit the closing of additional streets to traffic until the majority of the work on the closed streets is completed and they are opened to traffic.

1.4 RIGHTS-OF-WAY

- A. Whenever it is required to perform work within the limits of public or private property or in rights-of-way, such work shall be done in conformity with all agreements between the Owner and the owners of such. Care shall be taken to avoid injury to the premises entered, which premises shall be left in a neat and orderly condition by the removal of rubbish and the grading of surplus materials, and the restoration of said public or private property to the same general conditions as pertained at the time of entry for work to be performed under this contract.
- B. The Contractor shall not (except after consent from the proper parties) enter or occupy with men, tools or equipment, any land outside the rights-of-way or property of the Owner.
- C. When the Contractor performs construction within 10 ft. of a right-of-way or easement line, he shall place tall stakes properly identified at points of change in width or direction of the right-of-way or easement line and at points along the line so that at least two stakes can be seen distinctly from any point on the line.

1.5 EASEMENTS

- A. Where the work is to be constructed upon easements, such easements will be secured by the Owner without cost to the Contractor. The Contractor shall not enter upon or occupy any private property outside of the limits of the easements furnished.
- B. Care shall be taken to avoid injury to the premises entered, which premises shall be left in a neat and orderly condition by the removal of rubbish and the grading of surplus materials, and the restoration of said public or private property to the same general conditions as pertained at the time of entry for work to be performed under this contract.

1.6 PROTECTING EXISTING BUILDINGS, STRUCTURES AND ROADWAYS

- A. The Contractor shall, at his own expense, shore up and protect any buildings, roadways, utilities or other public or private structures which may be encountered or endangered in the prosecution of the work, and that may not be otherwise provided for, and he shall repair and make good any damages caused to any such property by reason of his operations. All existing fences removed due to the prosecution of the work shall be replaced by the Contractor. No extra payment will be made for said work or material, but the cost of this work must be included in the price stipulated for the work to be done under this contract.

1.7 SITE FACILITIES

- A. The Contractor shall furnish and place sufficient quantities of portable toilet facilities at locations convenient for use by the Contractor's personnel, Subcontractors, the Engineer, and the Owner.

1.8 RESTORATION

- A. On all contract items that require and include surface restoration including repairs to driveways and roads outside trench limits, an amount equal to 10% of the unit price bid for sewer and/or waterline items will be considered the value of this work.
- B. As work is completed, the payment for each contract item will be reduced by the 10% until full performance of all contract requirements.
- C. Partial release of the 10% restoration money may be made by the Engineer commensurate with his determination of the value of said work.
- D. If, in the opinion of the Engineer, the value of the restoration exceeds 10% of the contract line item, he may require a greater amount to be held but not in excess of 25%.
- E. The amount held for restoration shall not be considered retainage of completed work but rather the value of work not yet performed and therefore not eligible for payment.
- F. On lump sum items or contracts, the value of the restoration work will be determined by the approved schedule of values submitted by the Contractor.

END OF SECTION 011419

SECTION 013119 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 PRECONSTRUCTION MEETING

- A. Prior to the Contractor beginning any work on the project, the Owner will schedule and hold a preconstruction meeting to discuss all aspects of the contract work.
- B. The Contractor shall be present and be prepared to comment in detail on all aspects of his work.
- C. The Contractor shall bring to the preconstruction meeting a proposed construction progress schedule, erosion control plan, quality control program, concrete mix designs, asphalt mix designs (JMF), etc. Approval of each by the Engineer is required prior to the start of any work.
- D. Included in the construction progress schedule shall be an implementation sequence of the proposed erosion control efforts required by the contract.

END OF SECTION 013119

SECTION 013216 – CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 PROGRESS SCHEDULE

- A. Immediately after signing the Contract, the General Construction Contractor shall prepare a graphic progress schedule, indicating the work to be executed during each month and the rate of expected progress to secure completion on the agreed-upon completion date. The progress schedule shall be approved by the Engineer and Owner prior to starting work on the site. Copies of such graphic progress charts, upon which has been indicated the actual progress, shall be furnished to the Engineer with each requisition for payment.

This progress schedule must follow these general time frames (may vary with project):

1. Chip seal, paving fabric and/or the leveling course must start within 7 calendar days from the date of milling.
 2. Casting adjustments and/or curb replacements must start within 7 calendar days from the completion of the chip seal, intermediate course and/or fabric.
 3. Surface course asphalt concrete must begin installation within 7 calendar days from the completion of the casting adjustments and/or curb replacement.
 4. Traffic paint, temporary or permanent must be installed within a time period as deemed adequate and desirable for each location.
- B. Should the rate of progress fall materially behind the scheduled rate of progress, and unless the delay is authorized by the Engineer, each offending Contractor shall furnish additional labor, work overtime, or take other necessary means required for completion of the work on the scheduled date. No additional compensation beyond the set Contract price shall be paid for action taken or overtime expense incurred in maintaining scheduled progress.

END OF SECTION 013216

SECTION 013223.02 – SURVEY AND LAYOUT DATA

PART 1 - GENERAL

1.1 REFERENCE POINTS AND STAKING

- A. The Owner shall provide engineering surveys for construction to establish reference points which, in his judgment, are necessary to enable the Contractor to proceed with the work. The Contractor shall be responsible for surveying and laying out the work and shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of the Engineer. He shall report to the Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations. The Contractor shall replace and accurately relocate all reference points so lost, destroyed or moved.

1.2 LAYOUT OF WORK

- A. The Contractor shall lay out his work and be responsible for correct locations, elevations and dimensions of all work executed by him under this Contract. The Contractor must exercise proper precautions to verify the figures shown on the Drawings before laying out the work and will be held responsible for any error resulting from his failure to exercise such precaution. The Contractor shall employ a competent surveyor to establish lines and grades to insure the new construction aligns with any existing work.

END OF SECTION 013223.02

SECTION 013319.01 - FIELD TEST REPORTING
- AGGREGATE, SOILS, CONCRETE AND ASPHALT

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall be responsible for the quality of all materials incorporated into the project work and shall be responsible for all costs for testing and certification of same.
- B. The Contractor shall provide the engineer with a Quality Control Plan in which his testing methods/procedures are defined. Said Plan shall meet with the approval of the Engineer and include identification of laboratories, types of testing, and the tentative amount and scheduling of each.

All certification of tests and/or gradations for material to be utilized in the work and all quality control testing shall be performed by an independent laboratory (not affiliated with, owned by, or managed by the Contractor). The laboratory shall be accredited by the AASHTO Materials Reference Laboratory for the type of testing performed.

- C. The Owner may perform field Quality Assurance testing; however, such testing shall not relieve the Contractor from the responsibility of Quality Control testing or from supplying certificates from manufacturers or suppliers to demonstrate compliance with the specifications. It is intended that the testing by the Contractor and the Owner be complimentary toward a quality project; however, the Contractor may not assume the Owner will test or that any tests will be done in lieu of the Contractor's own Quality Control testing. In the same sense, the Contractor may not rely on Owner Quality Assurance testing as a basis of acceptance or approval of his work nor may any Owner-performed testing be reflected in his submitted plan.

1.2 TEST CRITERIA

- A. The following tests at a minimum shall be included with the Contractor's Quality Control Plan in accordance with the specifications:
 - 1. Aggregates
 - a. For each material and/or different source, the laboratory shall perform soundness, gradation, and other tests for all parameters specified. Aggregates incorporated into concrete or asphalt mixes shall also be tested for moisture content daily.
 - 2. Compaction Tests
 - a. Compaction tests or field density tests shall be taken on all embankment, trench backfill, subgrade, and subbase materials.

- b. Minimum testing shall be as follows:
Embankment testing shall be at least one (1) test/5,000 SF of each lift; Trench backfill testing shall be at least one (1) test/50 LF of each lift; Subgrade and/or subbase testing shall be at least one (1) test/200 LF of pavement or 5,000 SF of slabs; subject to greater frequency due to soil conditions or Engineer's direction.
 - c. Proctors or relative density tests shall be performed as often as necessary for the differing soils or granular materials utilized. Proctors shall be run with a minimum of 5 points. Test reports shall show the wet (bulk) weight, dry weight, wet (bulk) density, dry density, moisture content weight and moisture content percentage. Both the dry curve and the wet curve shall be plotted.
3. Concrete Mix Design
- a. For each type of concrete, the laboratory shall perform the necessary mix design providing all test data as required by the specifications.
4. Concrete Field and Laboratory Tests
- a. The laboratory shall cast concrete cylinders and test beams:
 - 1. One set of four cylinders per 50 CY with a minimum of two sets per day. The cylinders shall be broken: one at 7 days, two at 28 days, one at 56 days, unless otherwise directed by the Engineer.
 - 2. One beam per 50 CY with a minimum of two beams per day.
 - b. Temperature and unit weight shall be run on fresh concrete at intervals sufficient for the type of structure being placed and a minimum of once per day. Bulk weight, bucket weight, (tare), net weight, bucket factor (bucket volume) and unit weight shall be recorded on the fresh concrete report. Show all batch weights for yield calculations. Slump and air content tests shall be taken a minimum of one test per 20 CY and at least once per day.
 - c. All field and laboratory testing shall be performed by technicians certified by the American Concrete Institute (ACI) for the type of testing performed.
 - d. Initial cure of all cylinders shall be in a temperature controlled cure box or temperature controlled water tank with a hi-low thermometer. Hi-low temperature readings shall be recorded on the fresh concrete report.
5. Asphalt Mix Design
- a. For each type of asphalt mix, submit job mix formula (JMF) prepared by an ODOT pre-qualified laboratory from tests performed on the aggregates proposed for use.
 - b. Sample and test for gradation and bitumen content per ODOT 441.

1.3 LABORATORY REPORTS

- A. Reports of laboratory and field tests will be distributed to the Engineer, Owner, and Suppliers within 24 hours of completion.

END OF SECTION 013319.01

8/14/19

SECTION 013543 - ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 UNNECESSARY NOISE, DUST AND ODORS

- A. The Contractor's performance of this contract shall be conducted so as to eliminate all unnecessary noise, dust and odors.

1.2 SEWAGE, SURFACE AND FLOOD FLOWS

- A. The Contractor shall take whatever action is necessary to provide all necessary tools, equipment and machinery to adequately handle all sewage, surface flows and flood flows which may be encountered during the performance of the work. The entire cost of and liability for handling such flows is the responsibility of the Contractor and shall be included in the price for the appropriate item.

1.3 WORK IN FREEZING WEATHER

- A. Written permission from the Engineer shall be obtained before any work is performed which, in the judgment of the Engineer, may be affected by frost, cold, or snow. When work is performed under such conditions, the Contractor shall provide facilities for heating the materials and for protecting the finished work.

1.4 POLLUTION CONTROL

- A. It shall be the responsibility of the Contractor to prevent or limit pollution of air and water resulting from his operations.
- B. The Contractor shall perform work required to prevent soil from eroding or otherwise entering onto all paved areas and into natural watercourses, ditches, and public sewer systems. This work shall conform to all local ordinances and/or regulations, if any, and if not otherwise regulated by local ordinances or regulations shall at a minimum conform to the Ohio EPA General Storm Water NPDES Permit for Construction Activities and the Ohio Department of Natural Resources Rainwater and Land Development manual. This work may consist of but not be limited to construction and continual maintenance of silt fence, bio bag filters, sedimentation traps, stilling basins, check dams, temporary seeding, temporary mulching, erosion mats and other means to clarify waters containing suspended materials from excavations, embankments, cleared and grubbed or stripped areas, stockpiles, well points, and disposal sites and shall be commensurate with the contractor's schedule, sequence of work, means and methods. If a SWPPP plan is not required for the project, the contractor shall at a minimum submit a plan of his proposed erosion control prevention methods for approval by the Owner and/or other regulatory authorities having jurisdiction prior to starting any construction activities which may cause erosion.

- C. The Contractor shall perform work required to prevent dust attributable to his operations from entering the atmosphere. Dust on unsurfaced streets or parking areas and any remaining dust on surfaced streets shall be controlled with water and/or calcium chloride dust palliative as needed.
- D. Any material removed from sanitary or storm sewers shall be disposed in accordance with all applicable regulations.

END OF SECTION 013543

SECTION 014126 - GENERAL REGULATIONS AND PERMITS

PART 1 - GENERAL

1.1 REGISTRATION

All Contractors and subcontractors shall be registered with the Building Department having jurisdiction. Contact the Building Department for additional registration information.

1.2 PERMITS AND INSPECTIONS

The Contractor shall apply for and pay for all permits and inspections from the Owner and/or other authorities having jurisdiction.

1.3 ARCHAEOLOGICAL DISCOVERIES

Contractors and subcontractors are required under O.R.C. Section 149.53, to notify the Ohio Historical Society and the Ohio Historic Site Preservation Board of Archaeological Discoveries located in the project area, and to cooperate with those entities in archaeological and historic surveys and salvage efforts if such discoveries are uncovered within the project area.

Contact: Department Head
 Resource Protection and Review
 Ohio Historic Preservation Office
 800 E. 17th Avenue
 Columbus, Ohio 43211-2497
 614-298-2000

Should archaeological discoveries or other activities delay progress of the work, an adjustment in contract time will be made.

END OF SECTION 014126

SECTION 014323 – QUALIFICATIONS OF TRADESMEN

PART 1 - GENERAL

1.1 CHARACTER OF WORKMEN AND EQUIPMENT

- A. The Contractor shall employ competent and efficient workmen for every kind of work. Any person employed on the work who shall refuse or neglect to obey directions of the Engineer or his representative, or who shall be deemed incompetent or disorderly, or who shall commit trespass upon public or private property in the vicinity of the work, shall be dismissed when the Engineer so orders, and shall not be re-employed unless express permission be given by the Engineer. The methods, equipment and appliances used on the work and the labor employed shall be such as will produce a satisfactory quality of work, and shall be adequate to complete the contract within the specified time limit.

- B. In hiring of employees for the performance of work under this Contract, or any Subcontract hereunder, no Contractor or Subcontractor, nor any person acting on behalf of such Contractor or Subcontractor, shall, by reason of race, sex, creed or color, discriminate against any citizen of the State of Ohio in the work to which the employment relates. No Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, sex or color.

END OF SECTION 014323

SECTION 015526 - TEMPORARY TRAFFIC CONTROL DEVICES

PART 1 - GENERAL

1.1 BARRICADES, SIGNS AND LIGHTS

- A. The Contractor shall employ watchmen on the work when and as necessary. The Contractor shall erect and maintain such strong and suitable barriers and such lights as will effectively prevent the occurrence of any accident to health, limb or property. Lights shall be maintained between the hours of one-half (1/2) hour after sunset and one-half (1/2) hour before sunrise.
- B. No manhole, trench, excavation will be left open awaiting connection or removal at a later date by the Contractor's forces or others but shall be temporarily backfilled and resurfaced if applicable with a temporary pavement passable to traffic at no additional cost to the Owner.
- C. In addition to other safety requirements, a minimum of four (4) foot high fence will be incorporated around any shaft or manhole or other excavation left open at the end of a day's work.

1.2 MAINTENANCE OF TRAFFIC

- A. The Contractor is required to provide maintenance of traffic in conformance with the Ohio Manual of Uniform Traffic Control Devices and Item 614 of the current Construction and Material Specifications of the Ohio Department of Transportation.
- B. This work shall include providing suitable and satisfactorily trained and properly attired flagmen for use at any location where existing roadway is narrowed to a width of less than 2 full lanes (18 feet).
- C. The Contractor is also responsible for maintaining local access to all residences and businesses along the route of the sewer and to provide whatever temporary materials are necessary to provide a safe, adequate drive surface.
- D. At all boring locations, Contractor shall provide suitable flashers, barricades, and traffic control devices as may be deemed necessary by the Engineer or the responsible authority in the case of the Department of Transportation, Turnpike Commission, or Conrail. This may extend to maintain facilities on a 24-hour basis until such time as the areas are completely backfilled.

END OF SECTION 015526

SECTION 017800 - FINAL COMPLIANCE AND SUBMITTALS

PART 1 - GENERAL

- 1.1 The following forms and related sign-offs shall be documented in accordance with provisions of the contract. These forms shall be completed by the Contractor and approved by the Owner before final retainer is approved for release. Forms for Items A to E will be attached to the Contractor's executed copy of the contract.
- A. Certificate of Substantial Completion (To be submitted at time of Substantial Completion).
 - B. Contractor's Certification of Completion.
 - C. Contractor's Affidavit of Prevailing Wage.
 - D. Consent of Surety Company for Final Payment.
 - E. Affidavit of Final Acceptance Date and Correction Period.
 - F. Certificate of Insurance verifying completed operations insurance coverage.

END OF SECTION 017800

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

- B. This Section includes the following:

1. Hinges.
2. Lock and latch sets.
3. Bolts.
4. Exit devices.
5. Closers.
6. Overhead holders.
7. Weatherstripping for exterior doors.
8. Astragals or meeting seals on pairs of doors.
9. Thresholds.

- C. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 8 Section "Standard Steel Doors and Frames" for silencers integral with hollow metal frames.
2. Division 8 Section "Flush Wood Doors" for factory prefitting and factory premachining of doors for door hardware.
3. Division 8 Section "Aluminum Entrances and Storefronts" for aluminum entrance door hardware, except cylinders.

- D. Products furnished but not installed under this Section include:

1. Cylinders for locks on entrance doors.
2. Final replacement cores and keys to be installed by Owner.

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification sections.

- B. Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final hardware schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
 - a. Type, style, function, size, and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - e. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - h. Keying information.
 - 2. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.
- D. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.
 - 1. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.

- C. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.

1.5 PRODUCT HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.
- C. Inventory door hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- D. Deliver individually packaged door hardware items promptly to place of installation (shop or Project site).
- E. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of the Work will not be delayed by hardware losses both before and after installation.

1.6 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Butts and Hinges:
 - a. Bommer Industries, Inc.
 - b. Cal-Royal Products, Inc.
 - c. Hager Hinge Co.
 - d. Lawrence Brothers, Inc.
 - e. McKinney Products Co.
 - f. H. Soss & Company.
 - g. Stanley Hardware, Div. Stanley Works.

2. Locks:
 - a. Arrow Lock Manufacturing Co.
 - b. Best Lock Corp.
 - c. Corbin & Russwin Architectural Hardware, Div. Black & Decker Corp.
 - d. Falcon Lock Co.
 - e. Sargent Manufacturing Company.
 - f. Schlage Lock, Div. Ingersoll-Rand Door Hardware Group.
 - g. Yale Security Inc.

3. Bolts:
 - a. Builders Brass Works Corp.
 - b. Glynn-Johnson Corp.
 - c. Hager Hinge Co.
 - d. H. B. Ives, A Harrow Company.
 - e. Quality Hardware Mfg. Co., Inc.; Div. Newman Tonks, Inc.
 - f. Stanley Hardware, Div. Stanley Works.

4. Exit/Panic Devices:
 - a. Adams Rite Manufacturing Co.
 - b. Arrow Lock Manufacturing Co.
 - c. Corbin & Russwin Architectural Hardware, Div. Black & Decker Corp.
 - d. Dor-O-Matic.
 - e. Monarch Hardware & Mfg. Co., Div Newman Tonks, Inc.
 - f. Precision Hardware, Inc.
 - g. Reed Exit Hardware, Div. Yale Security Inc.
 - h. Sargent Manufacturing Company.
 - i. Von Duprin, Div. Ingersoll-Rand Door Hardware Group.
 - j. Yale Security Inc.

5. Overhead Closers:
 - a. Arrow Lock Manufacturing Co.
 - b. Corbin & Russwin Architectural Hardware, Div. Black & Decker Corp.
 - c. Dorma Door Controls International.
 - d. International Door Closers, Inc.

- e. LCN, Div. Ingersoll-Rand Door Hardware Group.
 - f. Monarch Hardware & Mfg. Co., Div Newman Tonks, Inc.
 - g. Norton Door Controls, Div. Yale Security Inc.
 - h. Rixson-Firemark, Div. Yale Security Inc.
 - i. Sargent Manufacturing Company.
 - j. Yale Security Inc.
6. Door Control Devices:
- a. Baldwin Hardware Corp.
 - b. Brookline Industries, Div. Yale Security Inc.
 - c. Builders Brass Works Corp.
 - d. Corbin & Russwin Architectural Hardware, Div. Black & Decker Corp.
 - e. Glynn-Johnson Corp.
 - f. Hager Hinge Co.
 - g. H. B. Ives, A Harrow Company.
 - h. Quality Hardware Mfg. Co., Inc.; Div. Newman Tonks, Inc.
 - i. Triangle Brass Manufacturing Company (Trimco).
7. Kick, Mop, and Armor Plates:
- a. Baldwin Hardware Corp.
 - b. Brookline Industries, Div. Yale Security Inc.
 - c. Corbin & Russwin Architectural Hardware, Div. Black & Decker Corp.
 - d. Hager Hinge Co.
 - e. Hiawatha, Inc.
 - f. H. B. Ives, A Harrow Company.
 - g. Triangle Brass Manufacturing Company (Trimco).
8. Door Stripping and Seals:
- a. Hager Hinge Co.
 - b. National Guard Products, Inc.
 - c. Pemko Manufacturing Co., Inc.
 - d. Reese Enterprises, Inc.
 - e. Sealeze Corp.
 - f. Ultra Industries.
 - g. Zero International, Inc.
9. Thresholds:
- a. Hager Hinge Co.
 - b. National Guard Products, Inc.
 - c. Pemko Manufacturing Co., Inc.
 - d. Reese Enterprises, Inc.
 - e. Sealeze Corp.
 - f. Zero International, Inc.

10. Automatic Drop Seals:

- a. Hager Hinge Co.
- b. National Guard Products, Inc.
- c. Pemko Manufacturing Co., Inc.
- d. Reese Enterprises, Inc.
- e. Zero International, Inc.

2.2 SCHEDULED HARDWARE

- A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in the "Hardware Schedule" at the end of this Section. Products are identified by using hardware designation numbers of the following:
1. Manufacturer's Product Designations: The product designation and name of one manufacturer are listed for each hardware type required for the purpose of establishing minimum requirements. Provide either the product designated or, where more than one manufacturer is specified under the Article "Manufacturers" in Part 2 for each hardware type, the comparable product of one of the other manufacturers that complies with requirements.

2.3 MATERIALS AND FABRICATION

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.
1. Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Base Metals: Produce hardware units of basic metal and forming method indicated using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units for finish designations indicated.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
- D. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
- E. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten

the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

2.4 HINGES

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Screws: Provide Phillips flat-head screws complying with the following requirements:
 - 1. For metal doors and frames install machine screws into drilled and tapped holes.
 - 2. For wood doors and frames install wood screws.
 - 3. For fire-rated wood doors install #12 x 1-1/4-inch (32-mm), threaded-to-the-head steel wood screws.
 - 4. Finish screw heads to match surface of hinges or pivots.
- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - 1. Out-Swing Exterior Doors: Nonremovable pins.
 - 2. Out-Swing Corridor Doors with Locks: Nonremovable pins.
 - 3. Interior Doors: Nonrising pins.
 - 4. Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.
- D. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90 inches (2250 mm) or less in height and one additional hinge for each 30 inches (750 mm) of additional height.
 - 1. Fire-Rated Doors: Not less than 3 hinges per door leaf for doors 86 inches (2150 mm) or less in height with same rule for additional hinges.

2.5 LOCK CYLINDERS AND KEYING

- A. Existing System: Grandmasterkey the locks to the Owner's existing system, with a new masterkey for the Project. All final cylinders will be provided by Santee Locksmith at direction of owner.

2.6 LOCKS, LATCHES, AND BOLTS

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set, unless otherwise indicated.
 - 1. Provide flat lip strikes for locks with 3-piece, antifriction latchbolts as recommended by manufacturer.
- B. Lock Throw: Provide 5/8-inch (16-mm) minimum throw of latch on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

1. Provide 1/2-inch (13-mm) minimum throw of latch for other bored and preassembled types of locks and 3/4-inch (19-mm) minimum throw of latch for mortise locks. Provide 1-inch (25-mm) minimum throw for all dead bolts.

- C. Flush Bolt Heads: Minimum of 1/2-inch- (13-mm-) diameter rods of brass, bronze, or stainless steel with minimum 12-inch- (300-mm-) long rod for doors up to 84 inches (2100 mm) in height. Provide longer rods as necessary for doors exceeding 84 inches (2100 mm) in height.

2.7 CLOSERS AND DOOR CONTROL DEVICES

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending on size of door, exposure to weather, and anticipated frequency of use.

1. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.
2. Provide parallel arms for all overhead closers, except as otherwise indicated.

- B. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing.

2.8 WEATHERSTRIPPING AND SEALS

- A. General: Provide continuous weatherstripping on exterior doors and smoke, light, or sound seals on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

- B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.

- C. Weatherstripping at Jambes and Heads: Provide bumper-type resilient insert and metal retainer strips, surface applied unless shown as mortised or semimortised.

2.9 THRESHOLDS

- A. General: Except as otherwise indicated, provide standard metal threshold unit of type, size, and profile as shown or scheduled.

2.10 HARDWARE FINISHES

- A. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

- B. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount hardware units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
 - 1. Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
 - 2. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7 Section "Joint Sealers."
- F. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
 - 1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- B. Clean adjacent surfaces soiled by hardware installation.
- C. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

D. Six-Month Adjustment: Approximately six months after the date of Substantial Completion, the Installer, accompanied by representatives of the manufacturers of latchsets and locksets and of door control devices, and of other major hardware suppliers, shall return to the Project to perform the following work:

1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
2. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.3 HARDWARE SCHEDULE

A. General: Provide hardware for each door to comply with requirements of Section "Door Hardware," hardware set numbers indicated in door schedule, and in the following schedule of hardware sets.

1. Hardware sets indicate quantity, item, manufacturer and product designation, size, and finish or color, as applicable.

Heading #1

1 SGL Door 001 Exterior from Storage 100	LHR
1 SGL Door 001C Exterior from Storage 100	RHR

3-0 x 7-0 x 1-3/4 - HM Door/HM frame

2	Hinges	780 - 112 HD 83"	CA
1	Lockset	82 8243 LNJ (001) LHR	26D
1	Lockset	82 8243 LNJ (001C) RHR	26D
	Cylinders by Santee Locksmith		
2	Closer	350 PSH	EN
2	Kick Plates	190 S 8" x 34"	US32D
2	Gasketing	160 VA 1 x 36" + 2 x 84"	US28
2	Threshold	896 V x 36"	AL
2	Door Sweep	102 VA x 36"	US28

SECTION 133418 – POST FRAME BUILDING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications sections apply to work specified in this section.
- B. Drawings and general provisions of the Contract make reference to the following:
 - 1. Ohio Basic Building Code

1.2 SUMMARY

- A. Extent of the post and frame building work is shown on drawings. Building is a single story, clear span, trussed type of height, length and width indicated on drawings.
- B. Manufacturer's standard components may be used, providing components, accessories, and complete structure conform to architectural design appearance shown and to specified requirements.
- C. The Contractor shall furnish all labor and materials to install a complete building as described herein.

1.3 DESCRIPTION OF WORK

- A. Manufacture and erect post and frame building and related items. Work included in this section is as follows:
 - 1. Building, including footings
 - 2. Gutters and downspouts
 - 3. Roof Shingles and accessories
 - 4. Sealant
- B. The Contractor will be responsible for obtaining all necessary building and zoning permits required for the installation of this structure.

1.4 SUBMITTALS

- A. Product Data: Prior to commencing construction, the Contractor shall submit manufacturer's technical data and erection instructions for review by the Engineer.
- B. Permits: Prior to commencing construction the Contractor shall submit evidence of approval from all agencies having jurisdiction over this project.
- C. Shop Drawings: Submit complete erection drawings showing sidewall, end wall and roof framing, transverse cross sections, footing detail, covering and trim details and accessory installation details to clearly indicate proper assembly of building components.

1. Shop drawings shall be signed and stamped by a structural engineer or registered architect licensed to practice in the jurisdiction where building will be installed.
 2. All shop drawings shall clearly identify the specific material being supplied, the quantity being supplied, and all accessories, dimensions, descriptions, mounting and connection details, and any other information necessary to determine compliance with the approved plans and Specifications. Details of all framing, flashing, and trim work for the finished openings shall be provided as part of the shop drawing submittals.
- D. Certification: Submit written Certification prepared and signed by a Professional Engineer or Architect, registered to practice in the State of Ohio, verifying that building design meets indicated loading requirements and codes of authorities having jurisdiction.
- E. Operation and Maintenance Manuals: Operation and Maintenance (O & M) Manuals shall be submitted to the Owner's Representative prior to final payment for the building.
- F. Warranty: The Manufacturer shall warrant that all material furnished shall be free of defects in the material and workmanship for a period of five years from the date of acceptance. In addition, the following materials shall carry a written warranty as described.

1.5 QUALIFICATIONS

- A. In addition to requirements of these Specifications, all work performed shall be in accordance with approved trade practices and manufacturers recommendations. All material and equipment shall perform as specified, and accessories shall be provided as necessary for satisfactory operation of the building.
- B. Manufacturer's Qualifications: Provide a post and frame building as produced by a manufacturer with not less than 5 years successful experience in the fabrication of pre-engineered pole buildings of the type and quality required.
- C. Erector's Qualifications: Post and frame building shall be erected by a firm that has not less than 5 years successful experience in the erection of post and frame buildings similar to that required for this project.
- D. In addition to the inherent loads in the structure, the Building shall be designed to withstand
1. Roof – design ground snow load of #30 psf plus the weight of the structure.
 2. Wind load of 115 mph.
 3. Trusses shall be designed to include a minimum ancillary load of 10 psf for future loads. This load is for future equipment and is in addition to any loads described herein or required by the Building Codes.
- E. Responsibility and Coordination:
1. Under this Contract, the Contractor shall be responsible for the purchase, storage, and subsequent installation of the building complete, and any accessories required.

The materials installed shall be durable and be suitable for incorporation into the structure.

2. This Specification is intended to illustrate and define the main parameters of the Building, but does not propose to cover all details entering into its design and construction; however, as part of the agreement, the Contractor shall properly install, adjust, and place in operation a complete building installation. The Contractor shall assume full responsibility for additional costs that may result from unauthorized deviations from the Specifications.
- F. The Contractor shall coordinate and verify that the materials furnished meet the Specification, system intentions, and design criteria prior to shipment from the manufacturers to the project site.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store prefabricated components, sheets, panels and other manufactured items so that they will not be damaged or deformed.
- B. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weather tight ventilated covering. Store metal sheets or panels so that water accumulations will drain freely. Do not store sheets or panels in contact with other materials that might cause staining.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Post and frame building Manufacturers:
 1. Morton Buildings, Inc.
 2. Hochstetler Building, Inc
 3. Wick Buildings, Inc
 4. Or approved equal.

2.2 WOOD PRODUCTS

- A. All wood products shall be #1 southern yellow pine or Douglas fir.
- B. Wood products installed within two feet of the finished ground surface shall be 0.6 pcf CCA-treated materials.
- C. Trusses shall be engineered to meet the loads specific to this structure and as specified herein. Columns and girts shall be installed with sufficient support to eliminate sidewall deflection when exposed to the design wind loads.

Columns shall be installed on concrete foundations that support the applied loads in both an upward and downward direction. Fasteners shall be provided and installed to meet the design criteria specified by the building designer.

2.3 TIMBER POSTS, SPLASHBOARDS AND FRAMING

- A. General: Comply with grading rules of grading agency for species of timber used:
 - 1. SPIB - Southern Pine Inspection Bureau;
 - 2. WWPA - Western Wood Products Association
- B. Wood Species: Fabricator's option as required to comply with design loads.
- C. Timber Posts and Splashboards: For the species used, comply with the following grade (or grades if more than one specified at Fabricator's option), for posts and other members as shown:
 - 1. WWPA Grade No. 1 (stress rated), 1400 psi minimum.
 - 2. Moisture Content: Provide timber dried to a maximum moisture content of 19 percent, and include "S-DRY" or similar indication in grade marking or certification of grade.
 - 3. Dressing: Provide timber that has been dressed on 4 sides (S4S) at mill, prior to grading. Comply with grade sizes.
 - 4. Connectors, Anchors and Accessories: Provide fabricated structural steel (ASTM A 36) shapes, plates and bars, welded into assemblies of types and sizes indicated, with steel bolts (ASTM A 307), lag bolts and other fasteners as required.
 - 5. Pressure treat all timber posts and splash boards with water-born preservatives for above ground use, complying with AWPB LB-2, or approved equal.
- D. Wood Headers and Girts: Miscellaneous wood to comply with wood requirements for timbers. Miscellaneous wood is not water-born preservative treated.
 - 1. Contractor to determine all header sizes to support design loads indicated on drawings.

2.4 WOOD TRUSSES

- A. Wood Trusses: Gable-shaped prefabricated type complying with wood requirements for timbers. Trusses are not to be water-born preservative treated.

Metal connector plates, fasteners and anchors shall be of metal complying with the following requirements:

- a. Connector Plates:
 - 1) Hot-dip Galvanized Steel Sheet: Structural (physical) quality steel sheet complying with ASTM A 446, Grade A; zinc coated by hot-dip process to comply with ASTM A 525, Designation G60; minimum coated metal thickness indicated but not less than 0.036".

- 2) Electrolytic Zinc-Coated Steel Sheet: Structural (physical) quality steel sheet complying with ASTM A 591, Coating Class C, and, for structural properties, with ASTM A 446, Grade A; zinc-coated or electro-deposition; with minimum coated metal thickness indicated but not less than 0.047".
 - 3) Aluminum-Zinc Alloy-Coated Steel Sheet: Structural (physical) quality steel sheet complying with ASTM A 792, with ASTM A 446, Grade A; aluminum-zinc alloy-coated by hot-dip process; with minimum coated metal thickness indicated but not less than 0.036".
- b. Fasteners and Anchorages: Provide size, type, material and finish indicated for nails, screws, bolts, nuts, washers and other anchoring devices.

2.5 ROOF SHINGLES – Refer to Drawing Specifications.

2.6 PLYWOOD SHEATHING

- A. Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood panels. Factory mark each panel with APA trade mark verifying compliance with grade requirements.

2.8 MISCELLANEOUS ITEMS

- A. Gutters and Downspouts shall be ASTM B 209, Alloy 3003, Temper H14, 0.032" thick (20 ga.) with anodized finish as selected by Owner.
1. General Metal Fabrication: Fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Sealant: "Dymonic" one-part one sag urethane type as manufactured by Tremco, Inc., or approved equal. Color to match adjacent surface color.

PART 3 - EXECUTION

3.1 DELIVERY AND STORAGE

- A. The Contractor shall coordinate the delivery and storage of the building materials with the Owner.

3.2 ERECTION OF STRUCTURE

- A. Structure: Erect timber posts true and plumb. Provide temporary bracing as required to maintain lines and levels until permanent supporting members are in place.
- B. Install girts as indicated on drawings. Locate and space to suit door arrangements and heights.
- C. Provide diagonal wall bracing for wind loads, supports for door opening headers and all structural elements to construct building.
- D. Erect trusses and brace in compliance with recommendations of manufacturer and Truss Plate Institute. Install bracing and related components to enable trusses to maintain design spacing, withstand live and dead loads, including lateral loads, and to comply with other indicated requirements.
- E. Provide proper post and header sizes to reinforce openings and carry loads and movement imposed for all framed openings.

3.3 INSTALLATION OF SHINGLES – Refer to Drawing Specifications.

3.4 INSTALLATION OF PLYWOOD

- A. Install plywood with face grain perpendicular to supports, using panel with continuous end joints over two or more spans staggered between panels and locate over supports.
 - 1. Allow minimum space between end joints and inch at edge joints for expansion and contraction of panels. Install "H" shaped panel clips @ 4'-0" o.c. maximum to maintain spacing.
 - 2. Nail 6 inches o.c. along panel edges and 12 inches o.c. at intermediate supports.
 - 3. Use 6d common, smooth ring-shank or spiral thread nails.

3.5 MISCELLANEOUS ITEMS

- 1. Install miscellaneous items per manufacturers' recommendation.

3.6 Anchorage: The Contractor shall be responsible for furnishing and placing all anchorage systems for the installation of the building. The Contractor shall coordinate with the building's design engineer and the manufacturer in identifying proper size and locations of all anchorage.

3.7 PUNCH LIST

- A. Prior to acceptance, conduct a review of the building with the Owner to observe any adjustments or corrections that are required to meet the intent of this specification, the codes, and the permit requirements.

- B. After installation of the building and prior to inspection by the Owner, the Contractor shall inspect and correct any dented or damaged panels that cannot be repaired to the satisfaction of the Owner.

3.8 SUBMITTAL INFORMATION

- A. Prior to completing the construction the Contractor shall submit materials in compliance with these specifications; as a minimum the submittal shall contain:
 - 1. Installation, operation, and maintenance instructions for the doors.
 - 2. An address, phone number, and contact person for servicing equipment and ordering parts.

3.9 CLEAN-UP

- A. Maintain site in clean and orderly fashion through-out the construction phase and remove all unsalvageable materials at completion of job.

END OF SECTION 133418

SECTION 320300 - EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work covered by this Section shall include all excavation work for the construction of the designated structures, backfill and other incidental work.
- B. The Work covered by this Section consists of:
 - 1. making all necessary excavations for the construction of all Work;
 - 2. preparing subgrade for foundations;
 - 3. doing all dewatering necessary to keep the excavation free from water;
 - 4. restoring all property damaged as a result of the Work involved in this Contract; and
 - 5. Remove trees/stumps located within building footprint.

1.2 RELATED DOCUMENTS AND SECTIONS

- A. Section 014100 - Field Testing Requirements

1.3 DEFINITIONS

- A. Backfill: Soil or granular materials used to fill an excavation.
- B. Borrow: Satisfactory soil imported for use as fill or backfill.
- C. Excavation: Removal and disposal of material encountered above subgrade or foundation elevations.
 - 1. Additional Excavation: Excavation below subgrade or foundation elevations as directed by Architect.
 - 2. Unauthorized Excavation: Excavation below subgrade or foundation elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
 - 3. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface or subsurface conditions encountered, including rock, soil materials and obstructions.
- D. Optimum Moisture: The water content at which the maximum density is produced in a soil by a given compaction effort (ASTM D-698).
- E. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material one (1) cu. yd. or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2 inches.

- F Soil: All earth materials, organic or inorganic, which have resulted from natural processes such as weathering, decay, and chemical reaction.

1.4 SUBMITTALS

- A. Comply with all provisions of Section 01061CT, Shop Drawings and Submittals.

1.5 PROJECT CONDITIONS

- A. Existing Conditions
 - 1. The Contractor shall satisfy himself, however, by actual examination on the site of the Work, as to the existing elevations and contours, and the amount of work required.

PART 2 - PRODUCTS

2.1 ONSITE BACKFILL

- A. Excavated soil material, capable of meeting specified compaction, and approved by the Architect for use as backfill in designated locations.
- B. Based upon subsurface investigation, the Owner does not guarantee the onsite soils in its present state consists of the proper moisture content to achieve the specified compaction without drying or adding water.
- C. Unsuitable Backfill Material
 - 1. Onsite materials that are unsuitable for backfill, unless otherwise specifically shown in the Drawings, include rock or other materials greater than six (6) inches in their largest dimension, pavement, rubbish, debris, wood, metal, plastic, frozen earth, and the following soils classified per ASTM D-2487:

Symbol	Description
OL	Organic silts and organic silty clays of low plasticity
MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
CH	Inorganic clays of high plasticity, fat clays
OH	Organic clays of medium to high plasticity
PT	Peat, muck, and other highly organic soils

PART 3 - EXECUTION

3.1 PROTECTION

- A. Excavation
 - 1. All excavation shall be in accordance with the Occupation Safety and Health Administration (OSHA) regulations.
 - 2. The Contractor shall furnish and install adequate bracing to maintain safe working conditions, and to protect newly built work from damage by settlement.
 - 3. Bracing shall be arranged so as not to place a strain on portions of completed work until construction has proceeded enough to provide ample strength.

3.2 DEWATERING

- A. Drainage and Removal of Water
 - 1. The Contractor shall dispose of water from the Work in a suitable manner without damage to adjacent property or structures.

3.3 GENERAL EXCAVATION

- A. All necessary excavation for structures and site improvements shall be performed to accommodate the completion of all related Contract Work.
- B. The methods and equipment used by the Contractor when approaching the bottom limits of excavation shall be selected to provide a smooth surface and to prevent disturbing the soil below the bottom limits of excavation. All soil loosened during excavation shall be removed from the bottom of the excavation.
- C. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.
- D. Excavation which is carried below the bottom limits of structures shall be classified as Unauthorized Excavation, unless said excavation below bottom limits of structures has been authorized by the Architect prior to each occurrence.
- E. Unauthorized Excavation shall be filled with Class B concrete to the bottom limits of structures. Under circumstances where structural integrity is not a factor, the Architect may authorize the filling of Unauthorized Excavation with Low Strength Mortar Backfill or Special Backfill material compacted to 100% density as specified under the compaction requirements in this Section. Such work shall be at the cost of the Contractor.

3.4 EXCAVATION OF UNSUITABLE MATERIALS

- A. Unsuitable materials existing below the Contract bottom limits for excavation shall be removed as directed by the Architect.
- B. Removal of unsuitable excavated material and its replacement as directed will be paid by allowances.

3.5 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIAL

- A. It shall be the responsibility of the Contractor to dispose of all surplus material that cannot be used in backfill or embankments at his expense outside the limits of the project. Unsuitable excavated material, including rock or large boulders, shall be disposed of outside the limits of the project.
- B. Surplus material may be wasted adjacent to or incorporated in the regular construction only when ordered in writing by the Architect.

3.6 BACKFILL

- A. Structures
 - 1. Backfilling shall not commence before concrete has attained specified strength. Do not use equipment for backfilling and compaction operations against structures that will overload the structure.
 - 2. Backfilling around and over structures shall be carefully placed and tamped with tools of suitable weight to a point one (1) foot above the top of same. Additional backfill may be required to protect the structure from damage from heavy equipment. Backfill shall be placed in uniform layers not exceeding eight (8) inches in depth. Each layer shall be placed, then carefully and uniformly compacted to the specified density so as to eliminate the possibility of displacement of the structure.
 - 3. After the backfill has been placed and compacted around the structure to the height specified above, the remainder may be backfilled by machine. The backfill material shall be deposited in eight (8) inch horizontal layers, and each layer shall be thoroughly compacted to the specified density by approved methods before a succeeding layer is placed.

3.7 SUBGRADE

- A. All soil subgrade shall be prepared in accordance with this subsection.
- B. Unsuitable Subgrade
 - 1. Where unsuitable subgrade or subgrade not meeting the required bearing capacity is encountered in cuts, due to no fault or neglect of the Contractor, in which satisfactory stability cannot be obtained by moisture control and compaction, the unstable material shall be excavated to the depth required by the Architect.

3.8 GRADING

A. Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading

1. Slope grades to direct water away from foundations and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - a. Lawn or unpaved areas shall be graded to plus or minus (1 inch).

END OF SECTION 320300

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Chain-link fences and gates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Fence and gate posts, rails, and fittings.
 - b. Chain-link fabric, reinforcements, and attachments.
 - c. Gates and hardware.
- B. Shop Drawings: For each type of fence and gate assembly.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Include accessories, hardware, gate operation, and operational clearances.
- C. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples of size indicated below:
 - 1. Polymer-Coated Components: In 6-inch (150-mm) lengths for components and on full-sized units for accessories.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of chain-link fence and gate.
- B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For gate operators to include in emergency, operation, and maintenance manuals.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.7 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to comply with performance requirements.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.
 - 1. Design Wind Load: 115 mph.
 - a. Minimum Post Size: Determine according to ASTM F1043 for post spacing not to exceed 10 feet (3 m) for Material Group IA, ASTM F1043, Schedule 40 steel pipe.
 - b. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

2.2 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:
 - 1. Fabric Height: As indicated on Drawings.
 - 2. Steel Wire for Fabric: Wire diameter of 0.148 inch (3.76 mm).
 - a. Mesh Size: 2-1/8 inches (54 mm).
 - b. Polymer-Coated Fabric: ASTM F668, Class 1 zinc-coated steel wire.

- 1) Color: As selected by Architect from manufacturer's full range, according to ASTM F934.
- c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.
3. Selvage: Knuckled at both selvages.

2.3 FENCE FRAMEWORK

- A. Posts and Rails ASTM F1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F1043 based on the following:
 1. Fence Height: As indicated on Drawings.
 - a. Line Post: 2.375 inches (60 mm) in diameter.
 - b. End, Corner, and Pull Posts: [2.875 inches (73 mm)].
 2. Horizontal Framework Members: Intermediate, top and bottom rails according to ASTM F1043.
 3. Brace Rails: ASTM F1043.
 4. Metallic Coating for Steel Framework:
 - a. Type A: Not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating according to ASTM A123/A123M or 4.0-oz./sq. ft. (1.22-kg/sq. m) zinc coating according to ASTM A653/A653M.
 - b. Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
 - c. External, Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- (0.0076-mm-) thick, zinc-pigmented coating.
 - d. Type C: Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. (0.55-kg/sq. m) coating.
 - e. Coatings: Any coating above.
 5. Polymer coating over metallic coating.
 - a. Color: As selected by Architect from manufacturer's full range, according to ASTM F934.

2.4 TENSION WIRE

- A. Polymer-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, tension wire according to ASTM F1664, Class 1 zinc-coated steel wire.
 - 1. Color: As selected by Architect from manufacturer's full range, according to ASTM F934.

2.5 SWING GATES

- A. General: ASTM F900 for gate posts and double swing gate types.
 - 1. Gate Leaf Width: As indicated.
 - 2. Framework Member Sizes and Strength: Based on gate fabric height as indicated.
- B. Pipe and Tubing:
 - 1. Zinc-Coated Steel: ASTM F1043 and ASTM F1083; protective coating and finish to match fence framework.
 - 2. Gate Posts: Round tubular steel.
 - 3. Gate Frames and Bracing: Round tubular steel.
- C. Frame Corner Construction: Assembled with corner fittings.
- D. Hardware:
 - 1. Hinges: 180-degree outward swing.
 - 2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.

2.6 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts.

3.3 CHAIN-LINK FENCE INSTALLATION

A. Install chain-link fencing according to ASTM F567 and more stringent requirements specified.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

C. Post Setting: Set posts in concrete.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

- a. Exposed Concrete: Extend 2 inches (50 mm) above grade; shape and smooth to shed water.

- b. Posts Set into Holes in Concrete: Form or core drill holes not less than 5 inches (127 mm) deep and 3/4 inch (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed according to anchoring material manufacturer's written instructions. Finish anchorage joint to slope away from post to drain water.

D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment as indicated on Drawings.

E. Line Posts: Space line posts uniformly at 10 feet (3 m).

F. Post Bracing and Intermediate Rails: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at mid-height of fabric 72 inches (1830 mm) or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

- G. Tension Wire: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- (3.05-mm-) diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches (610 mm) o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
 - 1. Extended along top and bottom of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches (152 mm) of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- H. Intermediate and Bottom Rails: Secure to posts with fittings.
- I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Provide minimal bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.
- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches (380 mm) o.c.
- K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches (300 mm) o.c. and to braces at 24 inches (610 mm) o.c.
- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side.

3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

3.5 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION 323113