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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. This Section identifies each Alternate by number, and describes the basic changes to be incorporated into the Work, only when that Alternate is made a part of the Work by specific provisions in the Owner-Contractor Agreement.

B. Alternates schedules below are part of the Bidding Documents and will be considered in selection of Contractors and awarding contracts.

C. Unless otherwise provided, Owner may accept or reject alternate over the life of the contract. Owner reserves the right to reject any or all Alternates.

1.3 ALTERNATES:

A. General:

1. The descriptions for each Alternate listed in the schedule are primarily scope definitions, and do not necessarily detail the full range of materials and processes needed to complete the work as required.
2. Refer to applicable specification sections (Divisions 2 through 16), and to applicable drawings, for specific requirements of the work, regardless of whether references are so noted in description of each alternative.
3. Coordinate pertinent related work and notify surrounding work as required to properly integrate the work under each Alternate, and to provide the complete construction required by Contract Documents.
4. Referenced sections of specifications stipulate pertinent requirements for products and methods to achieve the work stipulated under each Alternate.

B. Schedule:

1. Alternate #1 Areaway Fence / Gate:

    a. Quote change in price to demolish the existing gate and fence at areaway. Add fabrication and installation of new fence and gate per plan and details. Refer to drawings and specification for details.

2. Alternate #2 Access Gate:

    a. Quote modifications to the iron fence on west property line for the installation of a gate. Include the fabrication and installation of two leaf gate and related structure, flagstone walk, and Tierney House parking lot modification to provide access to the gate. Refer to drawings and specification for details.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 012300

SECTION 013323 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED:

A. Submit Shop Drawings, Product Data and Samples required by the Contract Documents.

1.2 RELATED REQUIREMENTS:

A. All applicable sections of the specification.

B. Conditions of the Contract.

C. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop Drawings, Product Data and Samples will be needed.

1.3 SHOP DRAWINGS:

A. Drawings shall be presented in a clear and thorough manner.

1. Details shall be identified by reference to sheet, detail, and schedule numbers shown on Contract Drawings.

1.4 PRODUCT DATA:

A. Preparation:

1. Clearly mark each copy to identify pertinent products of models.
2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.
4. Show piping diagrams and controls where required.

B. Manufacturer's Standard Schematic Drawings and Diagrams:

1. Modify drawings and diagrams to delete information which is not applicable to the work.
2. Supplement standard information to provide information specifically applicable to the work.

1.5 SAMPLES:

A. Office Samples shall be of Sufficient Size and Quantity to Clearly Illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.

1.6 CONTRACTOR RESPONSIBILITIES:

A. Review shop drawings, product data and samples prior to submission.

B. Determine and Verify:

1. Field measurements
2. Field construction criteria
3. Catalog numbers and similar data
4. Conformance with specifications

C. Coordinate each submittal with requirements of the work and of the Contract Documents.

D. Notify the Owner's Representative in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents.

E. Begin no fabrication or work which requires submittals until return of submittals with Owner's Representative or Architect's approval.

1.7 SUBMISSION REQUIREMENTS:

A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the work or in the work of any other Contractor.

B. Number of Submittals Required:

1. Shop Drawings: Submit the number of drawings that the Contractor requires, plus two (2) additional drawings that will be retained by the Owner’s Representative.
2. Product Data: Submit the number of copies that the Contractor requires, plus two (2) copies that will be retained by the Owner's Representative.
3. Samples: Submit the number stated in each specification section.

C. Submittals Shall Contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and Parcel number.
3. Contract identification.
4. The Names of:

    a. Contractor
    b. Supplier
    c. Manufacturer

5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8" x 3" blank space for Contractor and Owner's Representative / Architect's stamps.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the work and of Contract Documents.

1.8 RESUBMISSION REQUIREMENTS:

A. Make any corrections or changes in the submittals required by Owner's Representative and resubmit until approved.

B. Shop Drawings and Product Data:

1. Revise initial drawings or data and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those requested by the Owner's Representative.

C. Samples: Submit new samples as required for initial submittal.

1.9 DISTRIBUTION:

A. Distribute reproduction of Shop Drawings and copies of Product Data which carry the Owner's Representative's or Architect's stamp of approval to:

1. Job site file
2. Record Documents file
3. Other affected Contractors
4. Subcontractors
5. Supplier or Fabricator

B. Distribute samples which carry the Owner's Representative's or Architect's stamp of approval as directed by the Owner's Representative or Architect.

1.10 OWNER'S REPRESENTATIVE OR ARCHITECT DUTIES:

A. Review submittals with reasonable promptness and in accord with schedule.

B. Affix stamp and initials or signature and indicate requirements for resubmittal, or approval of submittal.

C. Return submittals to Contractor for distribution, or for resubmission.

PART 2 - PRODUCTS – Not Applicable

PART 3 - EXECUTION – Not Applicable

END OF SECTION 013323

SECTION 015639 - TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, General and Supplemental Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of tree and plant protection is shown on drawings and by provisions of this Section.

B. Related Work Specified Elsewhere:

1. Section 024113: Site Demolition
2. Section 312500: Soil Erosion and Sedimentation Control

1.3 DEFINITIONS:

A. Protective Barrier: A temporary device installed during the full period of construction to protect existing vegetation from damage or disturbance.

B. Damage: Physical change to the site or its vegetation caused by equipment, materials, labor or grading operations which has occurred after onsite work operations have commenced.

C. Drip-Line: The outer perimeter of the plant canopy projected on the ground plane.

D. Existing Vegetation: Any existing tree, shrub or ground cover presently on site and which will remain.

E. Protection: Means of protecting existing site vegetation from trespass, damage or disturbance by use of barriers or other means necessary to prevent trespass, damage or disturbance.

1.4 SUBMITTALS:

A. Certification: Submit written certification by qualified Arborist that trees and plants indicated to remain have been protected during course of construction in accordance with recognized standards and that where damage did occur, trees and plants were promptly and properly treated. Indicate which damaged trees and plants (if any) are incapable of retaining full growth potential and are recommended to be replaced.

1.5 QUALITY ASSURANCE:

A. Arborist Qualifications: Engage a certified Arborist who has successfully completed tree protection and trimming to perform the following work:

1. Remove branches from trees that are to remain if required.
2. Recommend procedures to compensate for loss of roots and perform initial pruning of branches and stimulation of root growth where removed to accommodate new construction.

3. Recommend procedures for excavation and grading work where adjacent to established plants.
4. Perform tree repair work for damage incurred by new construction.

1.6 PROJECT CONDITIONS:

A. Temporary Protection: Provide temporary fencing, barricades or other suitable guards located outside to protect trees and other plants that are to remain from damage.

B. Root Systems: Do not store construction materials, debris, or excavated material within drip line of trees to remain. Do not permit vehicles within drip line. Restrict foot traffic to prevent excessive compaction of soil over root systems within drip line.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Barriers: Plastic safety fence 4'-0" high.

1. Support barriers with 6'-0" steel fence posts spaced not more than 8'-0" o.c.

B. Topsoil: See Section 329119 - Topsoil.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION:

A. Do not commence clearing operations prior to installing protective barriers.

B. Protect tree root systems from damage due to noxious materials caused by run-off or spillage during mixing, placement or storage of construction materials. Protect root systems from flooding, eroding or excessive wetting resulting from watering operations.

C. Do not allow fires under or adjacent to trees or other plants that are to remain.

D. Coordinate with Owner removal of branches from trees that are to remain if required to clear new construction.

3.2 EXCAVATION AROUND TREES:

A. Excavate within proximity of trees only where indicated. Do not machine excavate within drip-line.

B. Where excavating for new construction is required within drip-line of trees, hand excavate to minimize damage to root systems. Provide sheeting at excavations if required. Use narrow-tine spading forks and comb soil to expose roots.

1. Relocate roots in backfill areas wherever possible. If large, main lateral roots are encountered, expose beyond excavation limits as required to bend and relocate without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots approximately 3 inches back from new construction.

C. Do not allow exposed roots to dry out before permanent backfill is placed; provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in moist condition and temporarily support and protect from damage until permanently relocated and covered with earth.

D. Where trenching for utilities is required within drip-line, tunnel under or around roots by hand digging. Do not cut main lateral roots or tap roots; cut only small roots that interfere with installation of new work. Cut roots with sharp pruning instruments; do not break or chop.

E. Prune branches to balance loss to root system caused by damage or cutting of root system.

3.3 GRADING AND FILLING AROUND TREES:

A. Maintain existing grade within canopy drip line of trees unless otherwise indicated.

B. Lowering Grades: Where existing grade is above new finish grade shown around trees, gradually slope grade away from trees as recommended by Arborist. Do not reduce grade more than 6 inches beneath canopy of tree.

1. Prune branches to stimulate root growth and to compensate for loss of roots. Provide subsequent maintenance during the contract period as recommended by Arborist. Provide Owner with typed instructions as recommended by Arborist. Provide Owner with typed instructions for recommended long-range maintenance procedures to be followed after completion of construction operations.

C. Raising Grades:

1. Minor Fills: Where existing grade is 6 inches or less below elevation of finish grade shown, use topsoil fill material specified. Place in single layer and do not compact; hand grade to required finish elevations.
2. Moderate Fills: Where existing grade is more than 6 inches, but less than 12 inches below finish grade elevation, place a layer of drainage fill on existing grade before placing topsoil. Carefully place against trunk of tree approximately 2 inches above finish grade elevation and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill to an elevation 6 inches below grade and completely fill with a layer of topsoil to finish grade elevation. Do not compact drainage fill or topsoil layers; hand grade to required elevations.

3.4 REPAIR AND REPLACEMENT OF TREES:

A. Repair trees if damaged by construction operations. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees.

B. Remove and replace dead and damaged trees that Arborist determines to be incapable of restoration to normal growth pattern.

1. Provide new trees of same size and species as those being replaced. Plant and maintain as acceptable to Architect and provisions stated in Section 320536 – Landscape Maintenance and Warranty Standards.

C. Maintain trees including fertilizing and watering.

3.5 DISPOSAL:

A. Burning removed trees and branches is not permitted on site.

B. Remove excess excavation, displaced trees and trimmings and dispose of off Owner's property.

END OF SECTION 015639

SECTION 023000 - SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, General and Supplementary Requirements, which are hereby made a part of this Section.

1.2 WORK INCLUDED:

A. Provide all labor, materials, necessary equipment and services to complete the subsurface investigation, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

B. The subsurface investigation for conditions of the project site is the sole responsibility of the Contractor. In preparing the proposal, the Contractor shall make all subsurface or surface investigations necessary to provide proper background and knowledge to determine the nature and extent of work required.

C. All known surface and subsurface data shown on the documents is based on survey drawings provided by Nowak & Fraus Engineers, 46777 Woodward Ave., Pontiac, MI 48342, Ph#: (248) 332-7931. Owner or Owner's Representative makes no warranties or guarantees, as to the accuracy or completeness of the drawings nor concerning the nature of materials to be encountered on the site.

D. Owner or Owner's Representative provides no subsurface information, and makes no warranties or guarantees concerning the nature of materials to be encountered on or under the site.

E. Related Work Specified Elsewhere:

1. Section 024113: Site Demolition
2. Section 312500: Soil Erosion and Sedimentation control
3. Section 312000: Earthwork for Site

PART 2 - PRODUCTS – Not Applicable

PART 3 - EXECUTION – Not Applicable

END OF SECTION 023000

SECTION 024113 - SITE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to Supplemental General Conditions, hereby made a part of this Section.

1.2 WORK INCLUDED:

A. Provide all labor, materials, necessary equipment and services to complete the site demolition, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

B. Related Work Specified Elsewhere:

1. Section 023000: Subsurface Investigation
2. Section 312000: Earthwork for Site
3. Section 312500: Soil Erosion and Sedimentation Control

1.3 SUBMITTALS:

A. Permit of transport and disposal of debris if required.

B. Demolition procedures and operational sequences for review and acceptance by Owner.

1.4 QUALITY ASSURANCE:

A. Contractor Qualifications: Minimum of five (5) years experience in demolition of comparable nature.

B. Requirements of All Applicable Regulatory Agencies:

1. All applicable Building Codes and other public Agencies having jurisdiction upon the work.

1.5 JOB CONDITIONS:

A. General:

1. It shall be the contractor’s responsibility to verify all existing survey information including utility systems before any demolition or construction work occurs. Any discrepancies with the survey information shall be reported to the landscape architect and owner’s representative immediately.
2. Erect barriers, fences, guard rails, enclosures and shoring to protect personnel, structures and utilities remaining intact.
3. Existing trees to be removed within the limits of work shall be clearly identified with brightly colored ribbon.
4. Contractor shall contact and coordinate with all applicable utility companies 72 hours in advance of any work.

5. Contractor shall be responsible for making himself familiar with all underground utilities, pipes and structures. Contractor shall take sole responsibility for cost incurred due to damage and replacement of said utilities.
6. All existing conditions designated to remain within the new construction area shall be properly and adequately protected from damage during demolition operations and throughout construction. It shall be the responsibility of the contractor to restore to the original condition any of these existing items that are damaged or disturbed in any way.
7. Contractor shall limit all work and disturbance to within designated project areas. It shall be the responsibility of the contractor to restore to the original condition any damage or disturbance outside these limits.
8. Streets, sidewalks and adjacent property shall be protected throughout the work as required by local codes and regulations and approved by the owner.
9. All material specified to be removed shall be disposed of off-site per local codes and regulations.
10. Materials to be reused or salvaged shall be stored in an area designated by the owner's representative for that purpose. All salvaged materials shall remain the property of the owner.

B. Maintain Traffic:

1. Ensure minimum interference with roads, streets, driveways, sidewalks and adjacent facilities.
2. Do not close or obstruct streets and sidewalks unless approved by the Owner.
3. If required by governing authorities, provide alternate routes around closed or obstructed traffic ways.

C. Dust Control:

1. Use all means necessary for preventing dust from demolition operations from being a nuisance to adjacent property owners. Methods used for dust control are subject to approval by the Architect prior to use and must comply with local ordinances and municipal requirements.

D. Burning:

1. On-site burning will not be permitted.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION

3.1 INSPECTION:

A. Verify that all items to be demolished are discontinued in use and ready for removal.

B. Do not commence work until all conditions and requirements of all applicable public agencies are complied with.

3.2 PREPARATION:

A. Notification: Notify the Owner at least three (3) full working days prior to commencing the work of this Section.

3.3 CLARIFICATION:

A. The drawings do not purport to show all objects existing on the site.

B. Before commencing the work of the section, verify with the Owner all objects to be removed and all objects to be preserved.

3.4 EXECUTION:

A. Stockpiled topsoil shall be stored on site and remain protected for redistribution under this contract.

B. All disturbed lawn areas shall be restored with 4" topsoil unless otherwise specified. Blend grades uniformly to meet.

C. Protect existing trees to remain with a 4'-0" height snow fence located at the drip line (as designated).

D. Grubbing shall include all weeds, shrubs, stumps and root systems of removed plant material, irrigation piping and any other irrigation materials within the limits of demolition. Grubbing shall be to the depths below proposed improvements indicated below:

1. Concrete Paving and Walkways – Total depth of paving and sub-base.
2. Lawn and other Planting Areas – Remove depth required for removal of stumps and roots over 2" in diameter.

E. Concrete pavement removals shall take place at the nearest joint to illustrated removal areas.

F. Full depth sawcuts shall be typical for all pavement removals.

G. Refer to layout plan for new pavement locations and dimensions, relative to existing pavement and turf removals.

3.5 SCHEDULING:

A. Schedule all work in a careful manner with all necessary consideration for the public and the Owner.

B. Avoid interference with the use of, and passage to and from adjacent facilities.

3.6 PROTECTION OF UTILITIES:

A. Preserve in operating condition all active utilities adjacent to or traversing the site and/or designated to remain.

3.7 OTHER DEMOLITION (IF APPLICABLE):

A. Removal of Debris: Remove all debris from the site and leave the site in a neat, orderly condition to the full acceptance of the Owner. No debris shall be left on the site overnight.

END OF SECTION 024113

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of each type of masonry work is shown on drawing and in schedules.

B. Related Work Specified Elsewhere:

1. Section 013323: Shop Drawings, Product Data and Samples
2. Section 044000: Dimension Stone
3. Section 079200: Joint Sealants

1.3 SUBMITTALS:

A. Product Data: Submit manufacturer's product data for each type of masonry unit, necessary, and other manufactured products, including certifications that each type complies with specified requirements.

B. Samples for Initial Selection Purposes: Submit samples of the following materials.

1. Colored masonry mortar samples showing full extent of colors available.

C. Samples for Verification Purposes: Submit the following samples:

1. Unit masonry samples for each type of exposed masonry units required; include in each set the full range of exposed color and texture to be expected in completed work.
2. Colored masonry mortar samples for each color required showing the full range of color which can be expected in the finished work. Label samples to indicate type and amount of colorant used.

1.4 QUALITY ASSURANCE:

A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surface.

B. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver masonry materials to project in undamaged condition.

B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

C. Store cementitious materials off the ground, under cover and in dry location.

D. Store aggregates where grading and other required characteristics can be maintained.

E. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.6 PROJECT CONDITIONS:

A. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

C. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.

D. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.

E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

F. Protect sills, ledges and projections from droppings of mortar.

G. Cold Weather Protection:

1. Do not lay masonry units which are wet or frozen.
2. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.
3. Remove masonry damaged by freezing conditions.
4. For clay masonry units with initial rates of absorption (suction) which require them to be wetted before laying, comply with the following requirements:

    a. For units with surface temperatures above 32 degrees F (0 degrees C), wet with water heated to above 70 degrees F (21 degrees C).
    b. For units with surface temperatures below 32 degrees F (0 degrees C), wet with water heated to above 130 degrees F (54 degrees C).

5. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout. For grout, temperature ranges apply to anticipated minimum night temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 degrees F (6 degrees C).

    a. 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C):

        1) Mortar: Heat mixing water to produce mortar temperature between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
        2) Grout: Follow normal masonry procedures.

    b. 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C):

1) Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C); maintain temperature of mortar on boards above freezing.
2) Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in place grout temperature of 70 degrees F (21 degrees C) at end of workday.

c. 25 degrees F (-4 degrees C) to 20 degrees F (-7 degree C):

1) Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C); maintain temperature of mortar on boards above freezing.
2) Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in place grout temperature of 70 degrees F (21 degrees C) at end of workday.
3) Heat both sides of walls under construction using salamanders or other heat sources.
4) Use windbreaker or enclosures when wind is in excess of 15 mph.

d. 20 degrees F (07 degrees C) and below:

1) Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
2) Grout: Heat grout materials to 90 degrees F (32 degrees C) to produce in place grout temperature of 70 degrees F (21 degrees C) at end of workday.
3) Masonry Units: Heat masonry units so that they are above 20 degree F (07 degrees C) at time of laying.
4) Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 degrees F (4 degrees C) for 24 hours after laying units.

e. Do not heat water for mortar and grout to above 160 degrees F (71 degrees C).

6. Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry, temperature ranges apply to anticipated minimum night temperatures.

a. 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C): Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.
b. 32 degrees F (0 degrees C) to 24 degrees F 9-4 degrees C): Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.
c. 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C): Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.
d. 20 degrees F (-7 degrees C) and below: Except as otherwise indicated, maintain masonry temperature above 32 degrees F (0 degrees C) for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 degrees F (4 degrees C) for 48 hours.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS:

A. General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

1. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.

B. Concrete Block: Provide units complying with characteristics indicate below for Grade, Type, face size, exposed face and, under each form of block included, for weight classification.

1. Grade N.
2. Size: Manufacture's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thickness indicated.
3. Type I, moisture-controlled units.
4. Exposed Faces: Manufacturer's standard color and texture.
5. Hollow Loadbearing Block: ASTM C-90, normal weight except use lightweight wherever exposed to view.
6. Solid Loadbearing Block: ASTM C-145, normal weight except use lightweight wherever exposed to view.

2.2 MORTAR AND GROUT MATERIALS:

A. Portland Cement: ASTM C-150, Type I.

B. Masonry Cement: ASTM C-91.

C. Hydrated Lime: ASTM C-207, Type S.

D. Aggregate for Mortar: ASTM C-144.

E. Aggregate for Grout: ASTM C-404.

F. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.

1. Color: As selected by Architect.
2. Products: Subject compliance with requirements, provide one of the following:

a. "SGS Mortar Colors"; Solomon Grind-Chem Services, Inc.
b. "Truce Tone Mortar Colors"; Davis Colors, a Subsidiary of Rockwood Industries, Inc.

G. Water: Clean and potable.

2.3 JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES:

A. Materials: Comply with requirements, indicated below for basic materials with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics.

1. Hot-Dip Galvanized Steel Wire: ASTM A-82 for uncoated wire and with ASTM A-153, Class B-2 (1.5 oz. per sq. ft. of wire surface) for zinc coating applied after prefabrication into units.
2. Hot-Dip Galvanized Carbon Steel Sheet: ASTM A-366, Class 2 or ASTM A-635; hot-dip galvanized after fabrication to comply with SSTM A-153, Class B.

B. Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below.

1. Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior and 1/2" elsewhere.
2. Wire Size for Side Rods: 0.1483" diameter.
3. Wire Size for Cross Rods: 0.1483" diameter.
4. For Multi-Wythe Masonry Provide Type as Follows:

    a. Truss design with diagonal cross rods spaced not more than 16" o.c. and number of side rods as follows:

        1) Number of Side Rods for Composite Construction: One side rod for each face shell of concrete masonry back-up and one rod for brick wythe.

5. Use units with adjustable 2-piece rectangular ties where horizontal joints of facing wythe do not align with those of back-up.

C. Manufacturers: Subject to compliance with requirements, provide products of one of the following:

1. AA Wire Products Co.
2. Dur-O-Wall, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.
5. Masonry Reinforcing Corp. of America
6. National Wire Products Corp.

2.4 MISCELLANEOUS MASONRY ACCESSORIES:

A. Reinforcing Bars: Deformed steel, ASTM A- 615, Grade 60.

B. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D-226, Type I (No. 15 asphalt felt).

C. Weepholes: Sash cord of length required to produce 2" exposure on exterior and 18" in cavity between wythes.

D. Isolation Material: Asphalt impregnated boxboard.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Column Wrap; Boomer Co.
    b. Brak-Bond; Cranco Industries.
    c. Column Box Board; Williams Products.

E. Copper Fabric Flashing: A full, single sheet of 502 copper bonded on both sides to asphalt coated glass fabric with a ductile asphalt, per ASTM B370.

1. Advanced copper fabric flashing manufactured by Advanced Building Products or approved substitute

2.5 MASONRY CLEANERS:

A. Job-Mix Detergent Solution: Solution of trisodium phosphate (1/2 cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water.

B. Acidic Cleaner: Manufacturer's standard strength general purpose cleaner design for new masonry surfaces of type indicated; composed of blended organic and inorganic acids combined with special wetting systems and inhibitors; expressly approved for intended use by manufacturer of masonry units being cleaned.

1. Products: Subject to compliance with requirements, provide the following:

a. "Sure Klean" No. 600 Detergent; ProSoCo, Inc.

2.6 MORTAR AND GROUT MIXES:

A. General: Do not add admixtures including coloring pigments, air entraining agents, accelerators, retarders, water repellent agencies, anti-freeze compounds or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

B. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM Standards for mixing time and water content.

C. Mortar for Unit Masonry: Comply with ASTM C-270, Proportion Specification, for type of mortar required, unless otherwise indicated.

1. Limit cementitious materials in mortar to Portland Cement-lime.
2. Use Type S mortar for all masonry, unless otherwise indicated.

D. Colored Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1-to-10, by weight. Submit color sample to Owner for approval.

E. Grout for Unit Masonry: Comply with ASTM C-476 for grout for use in construction of reinforced and non-reinforced unit masonry. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.

1. Use fine grout in grout spaces less than 2" in horizontal directions, unless otherwise indicated.
2. Use coarse grout in grout spaces 2" or more in least horizontal dimension, unless otherwise indicated.

2.7 CONCRETE FOR FOOTINGS:

A. Portland Cement: ASTM C-150, Type 1.

1. Type III may be used for high early strength concrete.
2. Use one brand of cement throughout project, unless otherwise acceptable to Architect.
3. 6 sack mix, 3,500 – 4,000 psi, 28-day compressive strength. W/C 0.35 max, air entrained.

B. Normal Weight Aggregates:

1. General: ASTM C-33 and as herein specified.

a. Local aggregates not complying with ASTM C-33, but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Architect.

C. Water: Drinkable.

D. Air-Entraining Admixture: ASTM C-260, certified by manufacturer to be compatible with other required admixtures.

E. Water-Reducing Admixture: ASTM C-494, Type A, and contain not more than 0.1% chloride ions.

2.8 FORM MATERIALS FOR FOUNDATIONS:

A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth exposed surfaces. Furnish in larges practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

1. Use overlaid plywood complying with U.S. Product Standard PS-1 “A-C or B-B Density Overlaid Concrete Form”, Class I.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal or other acceptable material. Provide lumber dress on at least 2 edges and for tight fit.

C. Form Ties: Factory-fabricated, adjustable-length, removable metal form ties, designed to prevent deflection and to prevent spalling concrete surfaces upon removal.

1. Use snap-off ties which will leave no metal closer than 1-1/2” to surface and when removed, will leave holes not larger than 1” diameter in concrete surface.

D. Form Coatings: Commercial formulation form-coating compounds that will not bond with stain, nor adversely affect concrete surface and will not impair subsequent treatments of concrete surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Masonry Installer must examine the areas and conditions under which masonry is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory condition has been corrected in a manner acceptable to masonry Installer.

3.2 INSTALLATION, GENERAL:

A. Do not wet concrete masonry units.

B. Cleaning Reinforcing: Before placing, remove rust, ice and other coatings from reinforcing.

C. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls so the actual thickness of the masonry units, using units of nominal thickness indicated.

D. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

1. Use dry cutting saws to cut concrete masonry units.

3.3 CONSTRUCTION TOLERANCES:

A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10'.

B. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

C. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.4 LAYING MASONRY WALLS:

A. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half size units at corners, jambs and wherever possible at other locations.

B. Layout walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not touch. Clean exposed surfaces of set masonry units and mortar prior to laying fresh masonry.

3.5 MORTAR BEDDING AND JOINTING:

A. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out fill mortar bed including areas under cells.

B. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

C. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

D. Tool exposed joints slightly concave using a jointer larger than joint thickness.

E. Remove masonry units disturbed after laying, clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

3.6 HORIZONTAL JOINT REINFORCEMENT:

A. General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls, 1/2" elsewhere, lap reinforcing a minimum of 6".

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Reinforce walls with continuous horizontal joint reinforcement, unless specifically noted to be omitted.

D. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosure and other special conditions.

E. Space continuous horizontal reinforcement as follows:

1. For multi-wythe walls (solid or cavity) where continuous horizontal reinforcement acts as structural bond or tie between wythes, space reinforcement as required by Code but not more than 16" o.c. vertically.

3.7 CONTROL AND EXPANSION JOINTS:

A. General: Provide vertical expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

B. Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 30'-0" o.c.

3.8 REPAIR, POINTING AND CLEANING:

A. Keep masonry faces clean during construction whenever possible, i.e. remove all mortar tags and stains before they cure, a light brushing with a soft brush upon initial mortar set.

1. Minimize condensation in shrinkage wrapped delivered masonry units.
2. Minimize mortar run-down with wet masonry units.
3. Protect base of wall from all mortar and mud splashes and remove grout spills immediately.

B. Remove and replace masonry units which are loose, chipped broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence or replacement.

C. Pointing: During the tooling of joints, enlarge any voids or holes, except weepholes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

D. Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave 1/3 panel uncleaned for comparison purposes. Obtain Architects approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agency, polyethylene film or waterproof masking tape.
4. Saturate wall surfaces with water prior to application of cleaners, remove cleaners promptly by rinsing thoroughly with clear water.
5. Use bucket and brush hand cleaning method described in BIA "Technical Note No. 20 Revised" using specified masonry cleaners.
6. Clean concrete unit masonry to comply with masonry manufacturer's directions and application NCMA "Tek" bulletins.

E. Protection: Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION 042000

SECTION 044000 - DIMENSION STONE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of hand set dimensional stonework is shown on drawings.

1. Dimension stonework with mortar joints
2. Dimension stonework with sealant joints
3. Stone cladding system

B. Related work specified elsewhere:

1. Section 013323: Ship Drawings, Project Data and Samples
2. Section 042000: Unit Masonry
3. Section 079200: Joint Sealants

1.3 SUBMITTALS:

A. General: Submit the following in accordance with drawings and specifications as stated herein.

1. Samples for verification purposes of stone in form of sets for each color, grade, finish, type, and variety of stone required and consisting of stones not less than 12 inches square. Include 2 or more stones in each set of samples showing the full range of variations in appearance characteristics to be expected in completed work.
2. Colored pointing mortar and grout samples for each color required showing full range of exposed color and texture to be expected in completed work.
3. Sealant samples for each type and color of joint sealant required.

    a. Sealant compatibility and adhesion test report from sealant manufacturer indicating that stone materials have been tested for compatibility and adhesion with joint sealants; include sealant manufacturer's interpretation of test results relative to material performance, including recommendations for primers and substrate preparation needed to obtain adhesion.

B. Samples for each type of stone, stonework accessory, and other manufactured products required.

C. Field Construction Mock-Up: Prepare mock-ups for the following types of dimension stonework. Purpose of mock-ups is further verification of selections made for color and finish under sample submittals and establishing standard of quality for aesthetic effects expected in complete work. Build mock-ups to comply with the following requirements:

1. Locate mock-ups on site where indicated or, if not indicated, as directed by Owner’s Representative.
2. Build mock-ups for the following types of dimension stonework:

a. Typical exterior stone-veneer-faced masonry pier, approximately 5’ high x 2’ square and bench, approximately 2’ high x 17’- 6” long.

3. Notify Owner’s Representative one week in advance of the dates and times when mock-ups will be erected.
4. Retain mock-ups during construction as standard for judging completed dimension stonework. Mock ups can be retained as permanent installation if acceptable to owner and architect.

1.4 QUALITY ASSURANCE:

A. Installer Qualifications: Engage an experienced Installer who has completed stone cladding similar in material, design, and extent to that indicated for project that has resulted in construction with a record of successful in-service performance. Installer must have a minimum of (5) years of related construction experience.

B. Single-Source Responsibility for Stone: Obtain each color, grade, finish, type and variety of stone from a single quarry with resources to provide materials of consistent quality in appearance and physical properties, including the capacity to cut and finish material without delaying the progress of the work.

C. Fabricate and install dimension stonework to withstand loads from wind, gravity, and movement as well as to resist deterioration under conditions of normal use including exposure to weather, without failure.

D. Single Source Responsibility for Mortar and Grout Materials: Obtain mortar ingredients of uniform quality and from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

E. Single-Source Responsibility for Other Materials: Obtain each type of stone accessory, sealant, and other materials from one manufacturer for each product.

F. Thermal Movements: Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the engineering, fabricating, and installing of stone cladding to prevent displacement of cladding, opening up of joints, and over stressing of components; failure of joint sealants and connections; and other detrimental effects. Base materials due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg), material surfaces.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to project site in undamaged condition.

B. Store and handle stone and related materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or other causes.

1. Do not use pinch or wrecking bars.
2. Store stone on wood skids or pallets covered with nonstaining, waterproof membrane. Place and stack skids and stones to distribute weight evenly and to prevent breakage or cracking of stones.

3. Protect stored stone from weather with waterproof, nonstaining covers or enclosures, but allow air to circulate around stones.
4. Store cementitious materials off the ground, under cover, and in dry location.

1.6 JOB CONDITIONS:

A. Cold Weather Protection: Comply with the following requirements:

1. Remove ice or snow formed on dimension stonework beds by carefully applying heat until top surface is dry to the touch.
2. Remove dimension stonework damaged by freezing conditions.

B. Perform the following construction procedures while dimension stonework is progressing:

1. Temperature ranges indicated apply to air temperatures existing at time of installation.
2. In heating mortar materials, maintain mixing temperatures selected within 10 deg F (6 deg C); do not heat water for mortar to above 160 deg F (71 deg C).
3. Mortar at 40 deg F (4.4 deg C) and below, produce mortar temperatures between 40 deg F (4.4 deg C) and 120 deg F (49 deg C) by heating mixing water and, at temperatures of 32 deg F (0 deg c) and below, sand as well. Always maintain temperature of mortar on boards above freezing.
4. At 25 deg F (-4 deg C) to 20 deg F (-7 deg C), heat both sides of walls under construction and use windbreaks or enclosures when wind is in excess of 15 mph.
5. At 20 deg F (-7 deg c) and below, provide enclosure and auxiliary heat to maintain an air temperature of at least 40 deg F (4.5 deg C) for 24 hours after setting dimension stonework, and heat stones so that they are above 20 deg F (-7 deg C) at time of installation.

C. Protect dimension stonework both in place and in progress to comply with the following requirements:

1. Temperature ranges indicated apply to mean daily air temperatures existing at time of installation.
2. At 40 deg F. 4.4 deg C) to 32 deg F (0 deg), protect dimension stonework from rain or snow at least 24 hours by covering with nonstaining weather-resistive membrane.
3. At 32 deg F (0 deg C) to 20 deg F (-4 deg C), cover dimension stonework completely with nonstaining weather-resistive membrane.
4. At 25 deg F (-4 deg C) to 20 deg F (-7 deg C), cover dimension stonework completely with nonstaining weather-resistive insulating blankets or similar protection for at least 24 hours.
5. At 20 deg F (-7 deg C) and below, maintain dimension stonework temperature above 32 deg F (0 deg C) for 24 hours.

PART 2 - PRODUCTS

2.1 GENERAL:

A. Comply with referenced standards and other requirements indicated applicable to each type of material required.

2.2 BLUESTONE:

A. Ashlar Bluestone Veneer: ASTM C616 – Type II Quartzite Sandstone, classification. Bluestones shall be varying heights 6y varying lengths x 3½" thickness (unless specified otherwise) to match residence veneer pattern exactly.

1. Bluestone shall be North River Blue Bluestone as supplied by Pacama Bluestone Kingston N.Y. (845) 334-8906.

2. The face surface of the stone veneer shall be split faced.

B. Aggregate: ASTM C-144 and as indicated below:

1. For joints narrower than 1/4-inch use aggregate graded with 100 percent passing the No. 8 sieve and 95 percent the No. 16 sieve.
2. For pointing mortar, use aggregate graded with 100 percent passing the No. 16 sieve.
3. Colored Mortar Aggregates: Ground marble, granite, or other sound stone, as required to match stone sample.
4. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in stone mortars.

a. Available Products: Subject to compliance with requirements, colored mortar pigments that may be incorporated in the work.
b. Products: Subject to compliance with requirements.
c. Water: Clean, nonalkaline, and potable.

5. Latex additive (water emulsion) described below, serving as replacement for part for all of gauging water, of type specifically recommended by latex additive manufacturer for use with job-mixed latex-modified materials of type indicated.

a. Latex Type: Styrene butadiene rubber in factory prediluted form.
b. Latex Type: Acrylic in factory prediluted or concentrated form.

6. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work.
7. Manufacturers: Subject to compliance with requirements, provide products.

2.3 DIMENSION STONE ANCHORS AND ATTACHMENTS:

A. Provide anchors and attachments of type and size required to support dimensions stonework.

2.4 DIMENSION STONE FABRICATION:

A. General: Fabricate dimension stonework in sizes and shapes required to comply with requirements indicated, including details on drawings and final shop drawings.

B. Cut and drill sinkages and holes in stones for anchors, fasteners, supports as indicated or needed to set dimension stonework securely in place; shape beds to fit supports.

C. Cut stones to produce pieces of thickness, size and shape indicated to comply with fabrication and construction tolerances recommended by applicable stone association or, if none, by stone source, for faces, edges, beds, and backs.

1. Thickness of Exterior Dimension Stone Cladding System: Provide stone cladding thickness required to comply with performance requirements.
2. Varying height x varing length x 3 1/2" thick.

D. Dress Joints (bed and vertical) straight and at 90-degree angle to face, unless otherwise indicated.

E. Cut stones to produce joints of uniform width and in locations indicated.

1. Joint width: match existing on residence.

F. Clean sawn backs of stones to remove rust stains and free iron particles.

G. Arrange pattern to match existing veneer on residence. Conform to approved jointing pattern from submitted and approved shop drawings.

H. Carefully inspect finished stones for compliance with requirements relative to qualities of appearance, material, and fabrication; replace defective stones with ones that do comply.

I. Grade and mark stones for overall uniform appearance when assembled in place. Natural variations in appearance are acceptable if installed stones match range of colors and other appearance characteristics represented in approved samples and field-constructed mock-ups..

2.5 MORTAR AND GROUT MIXES:

A. General: Comply with referenced standards and with manufacturers' instructions relative to mix proportions, mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality and with optimum performance characteristics.

B. Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or calcium chloride unless otherwise indicated.

C. Mixing: Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer unless otherwise indicated. Discard mortars and grout when they have reached their initial set.

D. Portland Cement/Lime Setting Mortar: Comply with ASTM C-270, Proportion Specification, for types of mortars and stone indicated below:

1. Set bluestone with Type N mortar.

E. Pointing Mortar: Provide pointing mortar mixed to match stone sample and complying with requirements indicated above for setting mortar for nonpaving applications including type and the following:

1. Colored Aggregate Pointing Mortar: Produce color required by combining colored aggregates with Portland Cement of selected color. Submit color sample to Owner for approval.
2. Colored Pigmented Grout: Select and proportion pigments with other ingredients to produce color required. Do not exceed pigment-to-cement ratio of 1-to-10 by weight.

3. Colored Aggregate Grout: Produce color required by combining colored aggregates with Portland Cement of selected color.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine surfaces to receive dimension stonework, and conditions under which dimension stonework will be installed, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of dimension stonework. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

A. Advise installers of other work about specific requirements relating to placement of inserts, flashing reglets, and similar items to be used by Stonework Installer for anchoring, supporting, and flashing of dimension stonework. Furnish Installers of other work with drawings or templates showing locations of these items.

B. Protect dimension stonework during erection as follows:

1. Cover top of walls with nonstaining waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches down both sides and hold securely in place.
2. Prevent staining of stone from mortar, grout, sealants and other sources. Immediately remove such materials from stone without damage to latter.
3. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

C. Clean stone surfaces that have become dirty or stained prior to setting to remove soil, stains, and foreign materials. Clean stones by thoroughly scrubbing stones with fiber brushes followed by a thorough drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh filler or abrasives.

3.3 INSTALLATION:

A. Execute dimension stonework by skilled contractors, and employ skilled stone fitters at the site to do necessary field cutting as stones are set.

1. Use diamond bladed power saws to cut stones; for exposed edges, produce edges that are cut straight and true.

B. Set stones to comply with requirements indicated on Drawings and final shop drawings. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure dimension stonework in place. Shim and adjust anchors, supports, and accessories to set stones accurately in locations indicated with uniform joints of widths indicated and with edges and faces aligned according to established relationships and indicated tolerances.

C. Construction Tolerances: Set stones to comply with the following tolerances:

1. Variation from Plumb: For lines and surfaces of walls, do not exceed 1/4 inch in 10 feet.
2. Variation in Cross-Sectional Dimensions: For thickness of walls from dimensions indicated, do not exceed minus 1/4 inch, or plus 1/2 inch.

3.4 SETTING DIMENSION STONEWORK WITH SEALANT JOINTS:

A. Attach anchors securely to stones and to backup surfaces.

B. For stones supported on clip or continuous angles, set stones on setting buttons, setting shims, or sheets of resilient low-durometer material.

1. Place setting buttons of adequate size, in sufficient quantity, and of same thickness as indicated joint width, to maintain uniform joint widths. Hold buttons at least on joint width back from face of stones.

C. Keep cavities open where unfilled space is indicated between back of stone cladding and backup wall; do not fill cavities with mortar or grout.

1. Cut bluestone cladding with dampproofing to the extent indicated below:

a. Stones at Grade: Beds, joints, back surfaces, and on face surfaces to at least 1'-0" above finish grade elevations.
b. Stones Extending Below Grade: Beds, joints, back surfaces, and on face surfaces to finish grade elevations.
c. Allow cementitious dampproofing formulations to cure before setting dampproofed stones. Do not damage or remove dampproofing in the course of handling and setting stone.

D. Sealing expansion joints shall be in compliance with Section 079200: Joint Sealants.

3.5 SETTING DIMENSION STONEWORK WITH MORTAR:

A. Set stones in full bed of mortar with vertical joints slushed full, unless otherwise indicated.

1. Place setting buttons of adequate size, in sufficient quantity, and of same thickness as indicated joint width, to prevent mortar from squeezing out and to maintain uniform joint widths. Hold buttons at least one joint width back from face of stones.
2. Do not set heavy stones or projecting courses until mortar in courses below has hardened sufficiently to resist being squeezed out of joint.

B. Support projecting stones by props or anchors until wall above is set.

C. Rake out mortar from joints to depths of not less than 1/2 inch nor less than that required to expose sound mortar for joints pointed with mortar, or to provide sufficient depth for sealant and sealant backing for joints pointed with sealants.

D. Prepare stone joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply first layer of pointing mortar in layers not greater than 3/8" inch until a uniform depth is formed; compact each layer thoroughly and allow to become thumb print hard before thumb print hard before applying next layer.

E. Point stone joints by placing and compacting pointing mortar in layers not greater than 3/8 inch.

F. Tool joints with a round joiner having a diameter 1/8 inch larger than width of joint, when pointing mortar is thumb print hard.

3.6 ADJUSTING AND CLEANING:

A. Remove and replace or repair dimension stonework of the following description:

1. Broken chipped, stained, or otherwise damaged stones. Broken, chipped, stained, or otherwise damaged stones may be repaired providing the methods and results are acceptable to Owner's Representative.
2. Defective joints.
3. Stones and joints not matching approved samples and field-constructed mockups.
4. Dimension stonework not complying with other requirements indicated.

B. Replace in manner that results in dimension stonework's matching approved samples and field-constructed mock-ups, complying with other requirements, and showing no evidence of replacement.

C. Clean dimension stonework not less than 6 days after completion of work, using clean water and stiff bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that could damage stone.

3.7 PROTECTION:

A. Provide final protection and maintain conditions in a manner acceptable to Fabricator and Installer ensures dimension stonework's being without damage or deterioration at time of Substantial Completion.

3.8 ACCEPTANCE:

A. Refer to Bidding and Contract Requirements.

3.9 CLEANING:

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris and equipment. Repair damage resulting from sodding operations.

END OF SECTION 044000

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 WORK INCLUDED:

A. Provide all labor, materials, necessary equipment, and services to complete the Joint Sealants work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

B. Related Work Specified Elsewhere:

1. Section 033000: Concrete Work
2. Section 042000: Unit Masonry
3. Section 321440.14: Flagstone Paving (Dry Set)

1.3 SAMPLES AND CERTIFICATES:

A. Submit the Following Samples:

Quantity	Size	Description
3	6" long	Filler for polyurethane
3	Color sample charts	Polyurethane sealants

B. Submit the Following Certificates for Compliance:

Description	Standards
Polyurethane (two components)	Per Specifications (TT-S-00227E, Type Class A ASTM C-920, TYPE M, Grade P, Class 25

1.4 COOPERATION:

A. Work of this section shall be provided and coordinated as required through procedures of construction that will insure safety.

1.5 GUARANTEE:

A. Furnish written guarantee for all sealant work stating that said work shall be free from any defects of material and/or workmanship for a period of five (5) years, commencing on the date of final completion and acceptance.

B. Said Guarantee Shall Further State that Sealants are Guaranteed Against:

1. Adhesive or cohesive failure of sealants in joints where movement is under maximum of ±25% extension or ±25% compression for two component polyurethane base sealant.
2. Any crazing greater than 3 mils in depth developing on the surface of the sealant material.

3. Any staining of the surfaces adjacent to the joints, by the sealants, primers, or joint filler materials, by migration through the adjacent materials in contact with them.
4. Any puncture, abrasion or tear failure due to pedestrian or vehicular traffic in self-leveling polyurethane base sealant installed at traffic surfaces.
5. Any visible chalking or color change on the cured surface of the sealant.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER'S AND MATERIALS:

A. Multi component chemically curing, polyurethane base sealant shall be manufactured to meet the specified requirements by the following manufacturer:

1. Tremco Corp., Contact: Construction Technical Services, Telephone (216) 292-5000, Fax (216) 766-5535.

B. Manufacturer's label shall indicate the expiration date of use of sealants or manufacturer shall otherwise attest to the date of manufacture. The period of time lapsed shall not be longer than six (6) months for polyurethane from the date of manufacturer to the date of usage on the job.

C. Primers where required shall be as recommended by the sealant manufacturer.

D. The color of sealants shall be as selected by Architect or as called for on drawings.

E. Bond-breakers where required shall be as recommended by the sealant manufacturer.

2.2 VERTICAL EXPANSION JOINTS:

A. Sealants at vertical joints shall be a multi-component polyurethane base sealant of a non-sag consistency non-staining by migration through the building materials and meeting or equal to requirements specified by the following manufacturer:

1. Tremco Dymeric 240FC multi component chemically cured polyurethane base sealant per Fed. Spec. TT-S-00227E and ASTM C-920.
2. Guarantee as herein before specified.

2.3 HORIZONTAL EXPANSION JOINTS: (Subject to Vehicular or Pedestrian Traffic):

A. Sealant at horizontal joints of self-leveling consistency, meeting or equal to requirements specified by the following manufacturer:

1. Tremco THC 900 or 901 multi-component chemically and polyurethane based sealant per Fed. Spec. TT-S-00227E, Type 1, Class A, ASTM C-920 Type M, Grade P, Class 25.

2.4 FILLER MATERIAL FOR VERTICAL AND HORIZONTAL JOINTS:

A. Filler material shall be a non-impregnated closed-cell, supporting type, compressible resilient, free from tar, asphalt, oil and other foreign substances. Filler shall be a closed-cell polyethylene foam, or isomeric polymer foam (polystyrene will not be allowed). Filler shape shall be such that sealant in joint is fully supported against puncture or pressure, but of design to prevent sealant from being forced out of joint by contraction. Filler shall have characteristics of not bonding with sealant, surface of filler. Filler shall be at least 25% wider than width of joint

measured in field to which it is applied. Compression on such installed filler shall be sufficient so as to allow no displacement.

1. Closed-cell polyethylene joint filler foam backer rod material shall comply with ASTM D-1622.
2. Where joint design, or depth of joint will not permit the use of joint backing, a bondbreaker tape must be installed to prevent three-sided adhesion. An adhesive backed polyethylene tape should be used.

2.5 EXPANSION JOINT CAPS:

A. Removable expansion joint caps manufactured by:

1. Contie
2. Greenstreak

B. Used with expansion joint filler, ready for sealant after removal.

PART 3 - EXECUTION

3.1 JOINT DIMENSIONS:

A. The depth of a joint is defined as the distance from the outside face of the joint to closest point of joint filler, whether joint is rod shaped.

B. Minimum size of joint should be four times the anticipated movement. Minimum joint dimension is 3/8" (9.5mm) x 3/8" (9.5mm), to allow for adequate cleaning and priming.

C. For joints 1/2" (13mm) and wider, the depth of the sealant should be no more than 1/2" (13mm) deep.

D. Joints to receive sealants shall be never less than 1/4" depth by 1/4" width.

E. Joints larger than the above stated minimum dimensions shall be provided in accordance with manufacturer's standard printed specifications and recommendations.

F. The General Contractor shall determine and provide joints of dimensions as specified herein before.

3.2 JOINT INSPECTION:

A. Inspect all joints which are to receive work of this section and notify Architect of dimensions and/or any existing conditions which will prevent satisfactory installation and performance of the sealants.

B. Commencement of work on any joint shall be considered full acceptance of dimensions and condition of said joint.

C. Joints to be sealed shall be thoroughly cleaned of mortar or any other foreign material in an approved manner before any sealant materials are applied. Any coating from metal surfaces shall be removed by use of solvent recommended by manufacturer of metal. Solvent shall not be allowed to air dry without wiping.

D. Concrete and masonry surfaces shall be fully cured, free of release agents, curing compounds, loose aggregate and other surface treatments. Treated surfaces shall be tested for adhesion before proceeding with sealant work.

E. Joint spaces and surfaces shall be thoroughly dry before installation of sealant materials. Unless approved means of drying joint is employed, do not install sealant material when temperature is below 40 degrees F or during and after rain and fog. To test for free moisture, run paper towel or paper napkin through joint. Paper shall be completely dry. Any alkaline seepage from fresh concrete shall be washed away, surface dried.

3.3 GENERAL WORKMANSHIP AND APPLICATION:

A. Use thoroughly experienced workmen in the application and as per manufacturer's recommendations.

B. Primer shall be used as it comes from can, unadulterated. Apply as per manufacturer's printed directions and/or recommendations. Prime joints before insertion of joint filler material.

C. Fill joint with filler material so that depth and width of joint have relationships as noted hereinafter under "Joint Dimensions".

D. When installing rod stock filler, roll filler into joint. Rod filler in final position shall not be twisted.

E. Bond-breaker strip shall be used in joints where sufficient room for back-up does not exist.

F. In mixing sealant compound components, do not whip excessive air into said materials. Mix strictly as recommended by manufacturer.

G. Sealant materials shall be applied within "application life" recommended by manufacturer for prevailing temperature and humidity conditions. Do not retemper.

H. Protect exposed surfaces adjacent to joints to prevent permanent staining or other damage to adjacent work. Be fully responsible for any staining and/or other damage caused under work of this section to any adjacent work.

I. If manufacturer indicates there is any possibility of color of sealant material being changed by use of wetting agents while tooling, Contractor shall dry tool.

J. Joints shall be lightly tooled into place immediately after application, when necessary to give concave shaped surface.

K. Immediately after application of sealants, thoroughly clean adjacent surfaces which may have been soiled, as per sealant manufacturer recommendations. Leave work in neat and clean conditions to full satisfaction of Architect.

3.4 GENERAL PERFORMANCE:

A. Sealants: Except as otherwise indicated, joints are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealants to comply with these requirements will be recognized as failures of materials and workmanship.

END OF SECTION 079200

SECTION 129300 - SITE FURNISHINGS

GENERAL
RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 WORK INCLUDED:

A. Provide all labor, materials, necessary equipment and services to complete the Site Furnishings work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated on "NIC ITEMS."

1.3 SUBMITTALS:

A. Manufacturer's Data:

1. Descriptive data of installation, methods, procedures and maintenance.

B. Complete shop drawings for all items of work under this section indicating all details of fabrication and installation, including sizes, shapes, finishes, colors, thickness, material quality and all other related work applicable to the items of this section.

1.4 DELIVERY, STORAGE AND HANDLING:

A. Deliver all materials with manufacturer's tags and labels intact.

B. Store and handle so as to avoid damage.

PART 2 - PRODUCTS

2.1 BENCHES:

A. Manufactured by Landscape Forms Inc. (800) 430-6209, or approved equal.

B. Quantity: (3)

C. Model: Wellspring Bench

1. Seat length – 73 ½”
2. Seat height 17 ½”
3. Seat quantity – four
4. Arm options - None
5. Mounting – Surface mount
6. Wood - Teak

PART 3 - EXECUTION

3.1 WORKMANSHIP AND INSTALLATION:

A. Provide as indicated and detailed on the drawings, and as per manufacturer's standard printed specifications, installation instructions and recommendations.

B. Provide complete shop drawing and manufactured cut sheets on all manufactured items.

C. Review layout of benches with Wayne State University prior to installation.

END OF SECTION 129300

SECTION 312000 - EARTHWORK FOR SITE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of earthwork and site grading is shown on drawings.

B. Related Work Specified Elsewhere:

1. Section 023000: Subsurface Investigation
2. Section 024113: Site Demolition
3. Section 312500: Soil Erosion and Sedimentation Control
4. Section 321440.14: Flagstone Paving (Dry Set)
5. Section 329119: Topsoil
6. Section 329223: Sodding
7. Section 329300: Plants

1.3 SUBMITTALS:

A. Test Reports: Submit copies of following reports directly to Owner's Representative. All test reports must be signed by licensed Engineer.

1. Test reports on borrow material.
2. Field density test reports.
3. One optimum moisture-maximum density curve for each type of soil encountered.
4. Other tests and materials certificates as required.

1.4 QUALITY ASSURANCE:

A. Codes and Standards: Perform earthwork and site grading in compliance with applicable requirements of governing authorities having jurisdiction.

B. Testing and Inspection Service: Contractor will engage testing and inspection service, to perform testing of soil materials proposed for use in work and to provide field facilities for quality control testing during earthwork and site grading operations.

1. Cooperate with soil testing and inspection service as it obtains samples of soil materials and furnish testing service with necessary samples of haul-in fill.

C. Tests for Proposed Soil Materials: Test soil materials proposed for use in work and promptly submit test result reports.

1. Provide one optimum moisture-maximum density curve for each type of soil encountered in subgrade and fills. Determine maximum densities in accordance with ASTM D-1557 (AASHTO T 180).

a. Analyze material within three feet of finished grades of paved areas to determine frost susceptibility.

b. Testing service will determine suitability of materials to be used in fill.

2. For borrow materials, perform a mechanical analysis (AASHTO T 88) plasticity index (AASHTO T 90), moisture-density curve (AASHTO T l80 or ASTM D-1557), and frost susceptibility analysis.

D. Comply with provisions of soil erosion and sedimentation control plan.

1.5 JOB CONDITIONS:

A. Site Information: Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by Contractor. Data are made available for convenience of Contractor.

1. Additional test borings and other exploratory operations may be made by Contractor at no cost to Owner.

B. Existing Utilities: Locate existing underground utilities in areas of work before starting earthwork operations. Where utilities are to remain in place, provide adequate means of protection during earthwork operations.

1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner, and public and private utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

C. Use of Explosives: Use of explosives is not permitted.

D. Temporary Protection: Barricade open excavations made as part of earthwork operations and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.

1. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
2. Perform excavation within drip-line of large trees to remain by hand and protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition of root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

E. All existing and proposed utility structures, including but not limited to manholes, catch basins, etc. that lie within the limit of work or areas affected by work on this project shall be adjusted to grade by the Contractor or the respective utility company for which the Contractor is responsible to coordinate.

PART 2 - PRODUCTS

2.1 DEFINITIONS:

A. Satisfactory soil materials are defined as those complying with ASTM D-2487 soil classification groups GW, GP, GM, SM, SW AND SP.

B. Unsatisfactory soil materials are defined as those complying with ASTM D-2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH and PT.

C. Cohesionless Soil Materials: Include gravels, sand-gravel mixtures, sands and gravely-sands.

D. Cohesive Soil Materials: Include clayey and silty gravels, sand-clay mixtures, gravel-silt mixtures, clayey and silty sands, sand-silt mixtures, clays, silts and very fine sands.

2.2 SOIL MATERIALS:

A. Backfill and Fill Materials: Use satisfactory soil materials for backfill and fill, free of rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter and complying with the above definitions.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine the areas and conditions under which earthwork for site is to be performed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

3.2 EXCAVATION:

A. General: Excavation consists of removal and disposal of materials encountered when establishing required grade elevations.

B. Unauthorized excavation consists of removal of material beyond indicated elevations or side dimensions without the specific direction of Architect. Replace unauthorized excavation by backfilling and compacting as specified for authorized excavations of same classification, unless otherwise directed by Architect. Cost of unauthorized excavation and remedial backfill shall be borne by Contractor.

C. Additional Excavation: When excavation has reached required subgrade elevations, notify Architect to allow for inspection of conditions.

1. If unsuitable materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect.
2. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

D. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations, and flooding project site and surrounding areas.

1. Establish and maintain temporary drainage ditches or diversions to convey water removed from excavations and rain water to collecting or run-off areas. Do not use trench excavations for site utilities as temporary drainage ditches.

E. Material Storage: Stockpile excavated materials classified as satisfactory soil material l. Do not allow water to accumulate in excavation. Remove water from excavations to prevent softening of foundation bottoms, undercutting footings and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines and other dewatering system components necessary to convey water away

from site where directed, until required for fill. Place stockpiled fill materials away from edges of excavation, grade and shape stockpiles for proper drainage.

1. Do not store fill materials within drip line of trees indicated to remain.
2. Dispose of excess unsatisfactory soil material, trash and debris as specified.

F. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F (1 degree C).

3.3 COMPACTION:

A. General: Control soil compaction during construction to provide the percentage of density specified for each area classification.

B. Percentage of Maximum Density Requirements: Compact soil to not less than following percentages of maximum dry density for soils which exhibit a well-defined moisture density relationship determined in accordance with ASTM D-1557; and not less than following percentages of relative density, determined in accordance with ASTM D-2049, for soils which will not exhibit well-defined moisture-density relationship.

1. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer of backfill or fill material at 85% maximum density for cohesive soils or 90% relative density for cohesionless material.
2. Walkways: Compact top 6" of subgrade and each layer of backfill or fill material at 90% maximum density for cohesive soil or 95% relative density for cohensionless material.
3. Pavements and Slabs-On-Grade: Compact top 12" of subgrade and each layer of backfill material at 90% maximum density for cohesive material or at 95% relative density for cohensionless material.

C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or to layer of soil material. Apply water in such manner as to prevent free water from appearing on surface during or subsequent to compaction operations.

1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
2. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing, until moisture content is reduced to satisfactory value.

3.4 BACKFILL AND FILL:

A. General: In excavations, use satisfactory excavated or borrow material, unless otherwise indicated that has been sampled, tested and approved by soil testing agency. Place in layers to required subgrade elevations indicated.

1. Under grassed areas, use satisfactory excavated or borrow material.

B. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions and deleterious materials from ground surface prior to placement of fills. Plow, strip or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

1. When existing ground surface has density less than that specified under "Compaction" for particular area classification, break-up the ground surface, pulverize, moisture-

condition to optimum moisture content and compact to required depth and specified percentage of relative density.

C. Placement and Compaction: Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment and not more than 4" loose depth for material compacted by hand-operated equipment.

1. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content of soil material. Compact each layer to required percentage of maximum dry density or relatively density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen or contain frost or ice.
2. Backfill excavations as promptly as work permits, but not until completion of inspection, testing, approval and recording location of underground utilities, as required.

3.5 GRADING:

A. General: Uniformly grade areas within limits of site grading under this Section, including adjacent transition areas. Smooth finished surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 1" above or below required subgrade elevations, compacted as specified, and free from irregular surface changes.

3.6 FIELD QUALITY CONTROL:

A. Make at least one field density test of subgrade for every 2000 sq. ft. of paved areas, but in no case less than 3 tests.

3.7 MAINTENANCE:

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

1. Repair and reestablish grades in settled, eroded and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required density prior to further construction.

C. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact and replace surface treatment. Restore appearance, quality and condition of surface of finish to match adjacent work and eliminate evidence over estimation to greatest extent possible.

3.8 DISPOSAL OF EXCESS AND WASTE MATERIALS:

A. Removal from Owner's Property: Remove waste materials, including excavated material classified as unsatisfactory soil material, trash and debris and legally dispose of it off Owner's property.

END OF SECTION 312000

SECTION 312500 - SOIL EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of soil erosion and sedimentation control is shown on drawings.

B. Related Work Specified Elsewhere:

1. Section 023000: Subsurface Investigation
2. Section 024113: Site Demolition
3. Section 312000: Earthwork for Site

1.3 QUALITY ASSURANCE:

A. Part 91, Soil Erosion and Sedimentation Control of the Natural Resource and Environmental Protection Act, Act 451 of the Public Acts of 1994, as amended, State of Michigan, requires that all site work be in compliance with the requirements of the Act and that a permit be obtained before starting work.

B. Current edition of Michigan Department of Transportation (MDOT) "Standard Specifications for Highway Construction".

C. Contractor shall pull permit and post an erosion control performance bond, as required, prior to any earth change.

D. Continually inspect for soil erosion and sediment control compliance. Correct deficiencies within 24 hours.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Provide materials as necessary to comply with MDOT Section 208 Soil Erosion and Sedimentation Control. All material proposed for use shall be subject to approval and modification by the Owner's Representative and the local enforcing agency.

PART 3 - EXECUTION

3.1 GENERAL:

A. Comply with requirements of the Soil Erosion and Sedimentation Control Act.

B. Install temporary erosion control measures before construction begins.

1. Install all required erosion control filters over storm sewer structures, prior to demolition operation.

2. Schedule and perform construction operation so that preventative soil erosion control measures are in place prior to excavation in critical areas and temporary stabilization measures are in place immediately following backfilling operations.

C. Select borrow and fill disposal areas with full consideration for soil erosion and sediment control.

D. Take special precautions in the use of construction equipment to prevent situations that promote erosion.

E. If the site is over five acres or within 500' of a lake or stream, then a national pollutant discharge elimination system (NPDES) permit for storm water discharge for the construction activities is required prior to any earth change.

F. Inlet filters are required at all catchbasins, existing and proposed.

G. Periodically remove collected silt and sedimentation as required where erosion control measures are implemented.

3.2 CLEANUP:

A. Remove temporary erosion control measures at completion of construction, unless otherwise directed by Architect to remain in place. Exercise caution during removal to minimize siltation of nearby drainage courses.

1. Remove any mud and soil tracked from site onto adjoining public streets, daily.

END OF SECTION 312500

SECTION 320536 - LANDSCAPE MAINTENANCE AND WARRANTY STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. The requirements of this section include a one-year warranty period from date of acceptance of installation.

B. Related Work Specified Elsewhere:

1. Section 329119: Topsoil
2. Section 329223: Sodding
3. Section 329300: Plants

1.3 ACCEPTANCE OF INSTALLATION:

A. At the completion of all landscape installation, or pre-approved portions thereof, the Landscape Contractor shall request in writing an inspection for acceptance of installation in which the Landscape Contractor and Owner's Representative shall be present. After this inspection a "Punch List" will be issued by the Owner's Representative. After completion of punch list items, the Contractor and Owner's Representative shall re-inspect the project and upon satisfactory completion of punch list items, issue a written statement of acceptance of installation and establish the beginning of the project warranty period.

B. It is the responsibility of the Landscape Contractor to make the above written request for inspection of installation in a timely fashion. If there is plant material loss prior to the Landscape Contractor's written request for inspection of installation, the Landscape Contractor shall make all replacements of this dead material at no additional cost. These replacements are not considered to be the required one (1) replacement of dead plant material by the Landscape Contractor during the one (1) year project warranty period, as outlined below.

C. Landscape work may be inspected for acceptance in parts agreeable to Owner's Representative provided work offered for inspection is complete, including maintenance as required.

D. For work to be inspected for partial acceptance, supply a written statement requesting acceptance of this work completed to date.

1.4 PROJECT WARRANTY:

A. The project warranty period begins upon written acceptance of the project installation by Owner's Representative.

B. The Landscape Contractor accepts responsibility for providing and operating a temporary irrigation system, watering schedule, watering amounts and monitoring system to ensure the plant survivability for duration of maintenance and warranty period.

C. The Landscape Contractor shall guarantee trees, shrubs, ground cover bed and sodded areas through construction and for a period of one year after date of acceptance of installation against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Landscape Contractor's control.

D. The Landscape Contractor shall warranty plants due to overwatering or under watering during maintenance and warranty period.

1.5 MAINTENANCE:

A. To insure guarantee standards, the following maintenance procedures shall be executed during construction and for the full project warranty period.

B. Maintenance of Plants:

1. Landscape Contractor shall be responsible for only one (1) replacement of any plant materials after project acceptance date, see Section 1.03, that are dead or in the opinion of the Owner's Representative are in an unhealthy or unsightly condition, or having lost natural shape, resulting from die back, excessive pruning, excessive or deficient watering practices, or inadequate or improper maintenance as part of the guarantee. Prior to any replacements Landscape Contractor shall review individual plants in question with Owner's Representative and determine the reason for plant demise.
2. Replacements must meet specifications i.e. quality, species of plant material and planting procedures to receive approval of replacement materials by Owner's Representative.
3. Costs for replacements are assumed part of bid quotations and therefore will not result in an additional cost to Owner.
4. Areas damaged as result of replacement operations are to be restored by Contractor at no cost to the Owner.
5. The Contractor shall be responsible for keeping guy wires taut, raise tree balls which settle, furnish and apply sprays as necessary to keep the plantings free of disease and insects until the end of the warranty period. All evergreens shall be watered thoroughly and wilt proofed in the fall to insure they do not go into the winter dry.
6. The Contractor shall be responsible for watering of all plantings throughout construction, maintenance and warranty periods.
7. The Contractor will be responsible for watering schedules, watering amounts and general monitoring throughout construction, maintenance and warranty period. Overwatering or lack of is the responsibility of the Landscape Contractor.
8. Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition. Remove rejected plants and materials promptly. Make replacements following normal planting schedule. Replace trees and shrubs which are in doubt, unless, in opinion of Owner's Representative it is advisable to extend warranty period for a full-growing season. Remove all stakes, guy wires, tree wrap paper, dead twigs and branches from tree and plant materials at the end of this warranty period. Keep planting beds free of weeds during guarantee period. See Trees, Plants and Ground Covers Section for suggested herbicides.

C. Maintenance of Sodded Lawn Area:

1. Maintain sodded lawn areas, including watering, fertilizing, spot weeding, mowing, application of herbicides, fungicides, insecticides, and resodding until a full, uniform stand of sod is knitted to topsoil.
2. Water sod thoroughly, as required to establish proper rooting.
3. Repair, rework and resod all areas that have washed out or are eroded. Replace undesirable or dead areas with new sod.
4. Provide a uniform stand of grass by watering, mowing, and maintaining lawn areas until acceptance of installation. Resod areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by Owner’s Representative.
5. Mow lawn areas as soon as lawn top growth reaches a 3" height. Cut back to 2" height. Repeat mowing as required to maintain specified height. Not more than 40% of grass leaf shall be removed at any single mowing. Minimum of two cuttings.
6. Sodded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, even colored viable lawn is established, free of weed, undesirable grass species, disease, and insects.
7. After acceptance of installation, and for the duration of the project warranty period the Landscape Contractor shall continue all maintenance procedures including fertilizing, weeding, rolling, regrading, resodding and applying herbicides, fungicides, insecticides as required to establish a smooth acceptable lawn, free of eroded or bare areas. The Landscape Contractor is not responsible for mowing after acceptance of installation.
8. See Section 1.5 B: Items 7 and 8.
9. At Conclusion of project warranty period and after receiving written final acceptance by Owner's Representative, the Owner shall assume all sodded lawn maintenance responsibilities.

1.6 FINAL ACCEPTANCE:

A. At the conclusion of the project warranty period the Landscape Contractor shall request a project inspection for final acceptance in which the Landscape Contractor and Owner's Representative shall be present. After this inspection a "Punch List" will be issued by the Owner’s Representative. Upon completion of all punch list items, the Owner's Representative shall reinspect the project and issue a written statement of final acceptance. Upon final acceptance the Owner assumes all maintenance responsibilities for the landscape of the project.

PART 2 - PRODUCTS - Not Applicable

PART 3 - EXECUTION - Not Applicable

END OF SECTION 320536

SECTION 321440.14 - FLAGSTONE PAVING (DRY SET)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of flagstone paving is shown on drawings; artistic mosaic random rectangular pattern.

B. Types of flagstone paving and applications include the following:

1. Dry set on aggregate base

1.3 RELATED WORK SPECIFIED ELSEWHERE:

C. Section 013323: Shop Drawings, Product Data and Samples

1.4 SUBMITTALS:

A. Samples: Submit the following for Owner's Representative review and approval prior to proceeding with construction:
1. Aggregate Base Stone: Submit one gallon sample, include source location, and sieve analysis test report confirming aggregate to be installed meets or exceeds specified base course aggregate. Refer to Table 1.
2. Bedding Sand: Submit one quart sample of specified bedding sand, include source location, and sieve analysis test report confirming bedding sand to be installed meets or exceeds specified bedding sand. Refer to Table 2.
3. Joint Sand: Submit one quart sample of specified joint sand, include source location, and sieve analysis test report confirming joint sand to be installed meets or exceeds specified joint sand. Refer to Table 3.
4. Flagstone Paving: Submit samples made up of actual stone color and texture requested. Include in each set of samples the full range of exposed color and texture to be expected in the completed work.

B. Product Data: Manufacturer's technical data for each manufactured product, including certification that each product complies with the specified requirements. Include instructions for handling, storage, installation, protection, and maintenance of each product.

1.5 QUALITY ASSURANCE:

A. Installer Qualifications: Engage an Installer who has successfully completed within the last three years at least three natural stone paving applications similar in type and size to that of this project and who will assign masons from these earlier applications to this project, of which one will serve as lead mason.

B. Field-Constructed Mockup: Prior to installation of flagstone paving, fabricate mockup using materials, pattern and joint treatment indicated for project work, including special features for expansion joints and contiguous work. Build mockup in form of panel at the site, in location as directed, of full thickness and approximately 4' x 3'. Provide range of color, texture and workmanship to be expected in the completed work. Obtain Owner's Representative

acceptance of visual qualities of mockup before start of brick paving work. Retain mockup during construction as a standard for judging completed bluestone paving work. Do not move or destroy mockup until work is completed.

C. Do not change source of paving or setting materials during progress of work.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Protect stone pavers during storage and construction against wetting by rain, snow or ground water and against soilage or intermixture with earth or other types of materials.

B. Do not store bedding sand on compacted aggregated base course or in areas that channel water into the sand. Cover bedding with waterproof coverings. Secure covering in place,

1.7 PROJECT CONDITIONS:

A. Cold Weather Protection:

1. Frozen Materials: Do not use frozen materials or materials mixed or coated with ice or frost.
2. Frozen Work: Do not build on frozen subgrade or setting beds. Remove and replace stone work damaged by frost or freezing.

PART 2 - PRODUCTS

2.1 FLAGSTONE PAVERS:

A. Material: Lake Erie Sandstone (reclaimed) Supplied by : Select Stone Company, Monclova, OH Ph#: (866) 519-3570

B. Edges: Quarry Cut .

C. Size: 2 ¼" thick x varying length and width, see drawings.

D. Color: Blue / Gray range only.

E. Submit full range samples for approval prior to obtaining material (3 total).

2.2 AGGREGATE BASE COURSE:

A. The base course shall be crushed 21AA limestone compacted to minimum 95% ASTM designation D-I557. The base course stone shall conform to the grading requirements of ASTM D2940 and as shown in Table 1

Table 1
Grading Requirements shall conform to the following sieve analysis:

Sieve Size	Percent Passing
1-1/2 in. (37.5 mm)	100
1" (25.0 mm)	85 to 100
3/4" (19.0 mm)	-
1/2" (12.5 mm)	50 to 75
3/8" (9.5 mm)	-
No. 4 (4.75 mm)	-

No. 8 (2.36 mm)	20 to 45
LBW	4 to 10

2.3 BEDDING SAND:

A. Bedding sand shall be well graded, clean, non-plastic and free from deleterious or foreign matter. The sand shall be sub-angular in shape from natural or manufactured from crushed rock. Limestone screenings, stone dust or blast furnace slag shall not be used. Do not use Mason sand or sand conforming to ASTM C144 for bedding sand.

B. Grading sand samples for the bedding couse shall be done according to the requirements of ASTM C136. The bedding sand shall conform to the grading requirements of ASTM C-33 as shown in Table 2.

Table 2
Grading Requirements for Bedding Sand – ASTM C-33

Sieve Size	Percent Passing
3/8 in. (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10

2.4 JOINT SAND:

A. Joint sand shall be well graded, clean, non-plastic and free from deleterious or foreign matter. The sand shall be sub-angular in shape from natural or manufactured from crushed rock. Limestone screenings, stone dust or blast furnace slag shall not be used.

B. Grading sand samples for the joints shall be done according to the requirements of ASTM C-136.

C. The joint sand shall be 2NS sand conforming to the grading requirements of ASTM C-144 as shown in Table 3 below.

Table 3
Grading Requirements for Joint Sand – ASTM C-144

Sieve Size	Percent Passing
No. 4 (4.75 mm)	100
No. 8 (2.36 mm)	95 to 100
No. 16 (1.18 mm)	70 to 100
No. 30 (0.600 mm)	40 to 75
No. 50 (0.300 mm)	10 to 35
No. 100 (0.150 mm)	2 to 15
No. 200 (0.075 mm)	0 to 5

D. Color: Tan or Grey. Submit samples to Wayne State University for approval. Install per manufacturers guidelines.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Installer must examine the areas and conditions under which fieldstone paving is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION, GENERAL:

A. Do not use fieldstone with chips, cracks, voids, discoloration or other defects beyond acceptable standards which might be visible or cause staining in finished work.

B. Wet cut fieldstone with motor-driven saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting.

C. Set fieldstone in random rectangular patterns shown and with uniform joints of width and alignment indicated.

D. Tolerances: Do not exceed a tolerance of 1/8" in 10' from level or slope as indicated for finished surface of paving.

E. Subgrade:

1. Assure subgrade is suitable material for specified paving installation. If not, Contractor shall excavate unsuitable material and replace with suitable material.
2. Subgrade shall be fine graded, wet and compacted to 95% modified proctor density.

F. Aggregate Base Course:

1. Install aggregate base course only after sub-grade has been approved.
2. Base course shall be spread in 4" layers to a depth specified on details and compacted to 95% modified proctor density (ASTM D-1557).
3. Aggregate base course shall extend a minimum of 6” beyond edge restraints per details or where applicable.
4. Allowable local tolerance of plus or minus 1/4" in 10’.

G. Sand Bedding Course:

1. Spread bedding sand to a uniform depth of 1 inch (plus or minus 3/16”) and screed level or to grade. Do not use bedding sand to fill in low spots or to bring the pavement to correct grade.
2. Screed rails shall not exceed 8’-12’ o.c. spacing.
3. Screed sand without compaction to a level slightly higher than the final thickness of the layer.

H. Flagstone Paving:

1. Place stone pavers by hand in specified pattern, with nominal 1-1/2” to 2” space between the pavers and where abutting concrete
2. Work stone pavers from centers of paving field out in all directions so equal cut pieces occur from side to side.
3. At edges and corners where pavers require cutting, do so by using a wet mason saw with a diamondblade or approved method. Note all cut edges shall be uniform and true to each individual paver and paving field edge. All cuts shall be made on job site.

I. Setting Pavers:

1. Entire paving fields shall be vibrated to their final level by minimum of three (3) passes of a vibrating plate compactor according to manufacturer's specifications. The first pass of the compactor shall be done without jointing sand spread on the surface. Protect pavers when compacting with a rubber liner attached to the bottom of the compactor or other approved cushion material.

2. Note, after first vibration pass, 2NS sand joint shall be brushed over the surface of all paver fields until joints are full.

3. Surplus material shall be swept from the surface and entire site left clean.

4. Do not use units with excessive chips, cracks, voids, discolorations, or other defects which might be visible or cause staining in finished work.

5. Set units in patterns shown and with uniform joints as indicated on the drawings.

6. Tolerances: Maintain surface plane for finished paving not exceeding a tolerance of 1/4" in 10' when tested with a 10' straight edge.

7. Installation and workmanship of all fieldstone shall be provided as per industry standards.

3.3 REPAIR, PROTECTION:

A. Remove and replace fieldstone that is, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment to eliminate evidence of replacement.

B. Cleaning: Remove excess sand from exposed stone surfaces.

C. Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures stone paving work being without damage or deterioration at time of substantial completion.

END OF SECTION 321440.14R

SECTION 323119 – STEEL ORNAMENTAL PICKET FENCING AND GATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Steel ornamental picket fencing and gates

1.2 RELATED SECTIONS

A. Related Work Specified Elsewhere:

1. Section 013323: Shop Drawings, Product Data and Samples.
2. Section 3213213.13: Exposed Aggregate Concrete Paving

1.3 DESCRIPTION OF WORK

A. The contractor shall provide all labor, material and equipment necessary for and incidental to proper completion of all fencing and gate installations. Location and extent of fencing and gates are as shown on drawings.

1.4 SUBMITTALS

A. Shop drawing of fences and gates with all dimensions, details, and finishes. Drawings must include post foundations.

B. Product data: Manufacturer's certification indicating materials compliance that all conditions of the specifications have been met.

C. Hinges, latches and hardware connections.

D. Manufacturers of fencing systems differing from the specifications herein shall be submitted to the Owner’s Representative 10 days prior to bid for consideration as a substitution. Failure to submit substitution request will result in possible rejection of bid.

1.5 QUALITY ASSURANCE

A. Provide manufacturer’s standard limited warranty that its ornamental fence system (rails, pickets and posts) are free from defects in material and workmanship including cracking, peeling, blistering and corroding for a period of 20 years from the date of purchase.

B. Fabrication and installation: Fabricator and installer shall be a subcontractor with not less than five (5) years of successful experience in the required types of fabrication and installation procedures.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials with manufacturer's tags and labels intact.

B. Handle and store so as to avoid damage.

C. All equipment parts and materials shall be new.

1.7 WARRANTY

A. All material and workmanship guaranteed against defect for one (1) year from time of final acceptance. Contractor to remedy any unsatisfactory conditions during guarantee period at no cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of design: The fence system shall conform to standard picket space. With ornate scrolls (C type) (King Architectural #13-20022-468) hanging between each picket and ornate collars (King Architectural #45-683-34) on each picket 8" from the top rail.

B. Picket fences and gates must be obtained from a single source.

C. Fence shall have Hanging C scroll adornments (King Architectural #13-20022-468) (color to match fence panel)..

2.2 ORNAMENTAL PICKET FENCE

A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft^2 (184 g/m^2), Coating Designation G-60.

B. Material for pickets shall be 3/4" square x 10 Ga. tubing. The rails shall be steel channel, 1.25" x 0.92" x 14 Ga. Picket holes in the rail shall be spaced 4.334" o.c. for standard picket space. Fence posts shall be a minimum of 2" square x 10 Ga, or as noted on details. Gate posts shall meet the minimum requirements of Table 1.

C. Height: 5' nominal, refer to drawings for special conditions.

1. Alternate #1: 2'-8" height for gate and fence, refer to drawing for special conditions.

D. Fence posts shall receive (1) ball cap finial on each post. Color to match fence.

2.3 ORNAMENTAL GATES

A. Gates shall be fabricated using welded ornamental panel material and gate ends having a 1-1/4" square cross-sectional size. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

B. Gate hinges shall be weld-able barrel style, color to match gate panel.

C. Gate shall include 24" drop rod (color to match gate panel).

D. Gate shall include lockable gravity gate latch.

E. Gate shall include ornate scrolls (C type) (King Architectural #13-20022-468) hanging between each picket and ornate collars (King Architectural #45-683-34) on each picket 8" from the top rail. (color to match gate panel).

2.4 FABRICATION

A. Gates, pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by welding.

C. The manufactured panels and posts shall be subjected to an inline electrode position coating (E-Coat) process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be Black. The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 (Note: The requirements in Table 2 meet or exceed the coating performance criteria of ASTM F2408).

D. The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.

2.5 SETTING MATERIALS

A. Concrete: Minimum 28 day compressive strength of 3,000 psi (20 Mpa).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify areas to receive fencing and gates are completed to final grades and elevations.

B. Property lines and legal boundaries of work to be clearly established by the general contractor.

3.2 FENCE INSTALLATION

A. Fence post shall be spaced according to Table 2, plus or minus ½". For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer.

3.3 FENCE INSTALLATION MAINTENANCE

A. When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty.

3.4 CLEANING

A. Clean up debris and remove from the site.

Table 1 – Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,000 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 2 – Montage - Post Spacing By Bracket Type

Span	For CLASSIC, GENESIS, MAJESTIC, WARRIOR, CRESCENT, GEMINI 8' Nominal (94" Rail)			
Post Size	2"	2"	2"	2"
Bracket Type	Montage Universal (BB102)	Montage Line Boulevard (BB104)	Montage Flat Mount (BB105)	Montage Swivel (BB106)
Post Settings ± ½" O.C.	96-3/4"	96-3/4"	96-3/4"	96-3/4"

* Note: When using BB106 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.

END OF SECTION 323119

SECTION 329119 - TOPSOIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, General and Supplemental Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of Topsoil Work is shown on drawings and by provisions of this Section.

B. Topsoil for lawn work shall be as stripped from site or provided by Contractor from off-site sources free of herbicides.

C. Related Work Specified Elsewhere:

1. Section 329223: Sodding
2. Section 329300: Plants

1.3 QUALITY ASSURANCE:

A. Testing and Inspection: For supplied and/or stockpiled topsoil. Performed by a qualified independent testing laboratory, under the supervision of a Registered Professional Engineer, specializing in soils engineering. Obtain samples of stockpiled topsoil before completely stripping from the interior of stockpile.

B. Provide and pay for testing and inspection during topsoil operations. Laboratory shall be acceptable to the Owner's Representative.

1. Recommended Testing Laboratory:
   A & L Great Lakes Laboratories, Inc.
   3505 Conestoga Drive
   Fort Wayne, IN 46808
   P: (260) 483-4759
   F: (260) 483-5274
   www.algreatlakes.com

C. Test representative material samples for proposed use.

D. Tests shall include:

1. pH factor
2. Lime requirement
3. Mechanical analysis (P.K. Ca. mg) and cation ratios
4. Percentage of organic content and loss by ignition
5. Soil series classification
6. Clay content
7. Herbicide multi-residue test (MR-1)

E. Provide soil lab recommendations on type and quantity of additives required to establish satisfactory pH factor and supply of nutrients to bring nutrients to satisfactory level for planting and soil lab recommendations regarding residue test results.

F. Submit test reports.

1.4 PROJECT CONDITIONS:

A. Known underground and surface utility lines are indicated on the civil drawings.

B. Protect existing trees, plants, lawns and other features designated to remain as part of the landscaping work.

C. Promptly repair damage to adjacent facilities caused by topsoil operations. Cost of repair at Contractor's expense.

D. Promptly notify the Landscape Architect of unexpected sub-surface conditions.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Topsoil: Supplied topsoil proposed for use must meet testing criteria results specified and conform to adjustments as recommended by soil test and Owner’s Representative.

B. Provide screened topsoil as required to complete the job. Topsoil must meet testing criteria results specified. All processing, cleaning and preparation of this topsoil to render it acceptable for use is the responsibility of this Contractor.

C. Supplied topsoil shall be screened, fertile, friable and representative of local productive soil, capable of sustaining vigorous plant growth and screened free of clay lumps, subsoil, noxious weeds or other foreign matter such as stones greater than 1" in diameter in any dimension, roots, sticks and other extraneous materials: not frozen or muddy. pH of existing or supplied soil to range between 5.0 and 7.5. Adjusted to not more than 7.0 by additives as required by soil test. Topsoil shall contain not less than 3% and not greater than 10% organic matter. Clay content as determined by Bouyoucous Hydrometer Test shall range between 5 and 15 percent.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine rough grades and installation conditions. Do not start topsoil work until unsatisfactory conditions are corrected.

3.2 FINISH GRADING:

A. Perform topsoiling within contract limits, including adjacent transition areas, to new elevations, levels, profiles, and contours indicated. Provide uniform levels and slopes between new elevations and existing grades.

B. Grade surfaces to assure areas drain away from building structures and to prevent ponding and pockets of surface drainage.

C. Lawn Areas: Supply and spread topsoil to a minimum uniform depth of 4” or as noted. Remove clumps larger than 1” in diameter.

D. Grade lawn areas to a smooth, free draining even surface with a loose, moderately coarse texture ready to accept seed or sod.

E. For trees, shrubs, ground cover beds and backfill for beds see Section 329300 – Plants.

F. Provide earth crowning where indicated on drawings.

G. Crowning/mounding to be free flowing in shape and design, as indicated, and to blend into existing grades gradually so that toe of slope is not readily visible. Owner's Representative to verify final contouring before planting.

H. Regardless of finish grading elevations indicated, it is intended that grading be such that proper drainage of surface water will occur and that no low areas are created to allow ponding. Contractor to consult with Owner's Representative regarding minor variations in grade elevations before rough grading is completed.

3.3 CLEANING:

A. Upon completion of topsoiling operations, clean areas within contract limits, remove tools and equipment. Site shall be clear, clean, free of debris and suitable for site work operations.

END OF SECTION 329119

SECTION 329223 – SODDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions, hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of sodded lawns is shown on drawings and by provisions of this Section.

B. Type of Work Required Includes the Following:

1. Soil preparation
2. Sodding lawns

C. Related Work Specified Elsewhere:

1. Section 320536: Landscape Maintenance and Warranty Standards
2. Section 329119: Topsoil
3. Section 329300: Plants

1.3 SUBMITTALS:

A. Submit sod grower's certification of grass species including special shade grown species. Identify source location.

B. Manufacturer's certification of fertilizer.

1.4 QUALITY ASSURANCE:

A. Sod: Comply with American Sod Producers Association (ASPA) classes of sod materials.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Cut, deliver and install sod within 24-hour period.

B. Do not harvest or transport sod when moisture content may adversely affect sod survival.

C. Protect sod from sun, wind and dehydration prior to installation. Do not tear, stretch or drop sod during handling and installation.

1.6 PROJECT CONDITIONS:

A. Work Notifications: Notify Owner's Representative at least 7 working days prior to start of sodding operation.

B. Protect existing utilities, paving and other facilities from damage caused by sodding operations.

C. Perform sodding work only after planting and other work affecting ground surface has been completed.

D. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.

E. Provide hose and lawn watering equipment as required.

F. An irrigation system will be installed by Owner prior to sodding. Coordinate with irrigation installer and protect and maintain the irrigation system during sodding operations. Notify Owner's Representative of any irrigation system components damaged during sodding operation. Repairs to be made at Landscape Contractor's expense.

1.7 WARRANTY:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Sod: An "approved" nursery grown blend of improved Kentucky Blue-grass varieties.

1. Sod containing Common Bermudagrass, Quackgrass, Johnsongrass, Poison Ivy, Nutsedge, Nimblewill, Canada Thistle, Timothy, Bentgrass, Wild Garlic, Ground Ivy, Perennial Sorrel or Bramegrass weeds will not be acceptable.

B. Provide well-rooted, healthy sandy-loam topsoil grown sod, (submit grower and soil analysis for review). Sod shall be free of diseases, nematodes and soil borne insects. Peat grown sod is not acceptable. Provide sod uniform in color, leaf texture, density and free of weeds, undesirable grasses, stones, roots, thatch and extraneous material; viable and capable of growth and development when planted.

C. Furnish sod machine stripped in square pads or strips not more than 3'-0" long; uniformly 1" to 1-1/2" thick with clean-cut edges. Mow sod before stripping.

D. Fertilizer: Use a 1-2-1 NPK ratio SGN 100-210 starter fertilizer that is non injurious to turf with a sustained release of nitrogen to provide 10-16 weeks of fertility. Phosphorus and potassium amendments shall be industry standard. If soil test results show adequate phosphorus and potassium then NPK ratio shall be amended to 3-0-2. Lower rate to .1 lb N per week release, (see 3.2, F for application rates).

E. Ground Limestone: Containing not less than 85% of total carbonates and ground to such fineness that 50% will pass through a 100 mesh sieve and 90% will pass through a 20 mesh sieve. Use if determined by soil tests to be necessary.

F. Stakes: Softwood, 3/4" x 8" long.

G. Water: Free of substance harmful to sod growth. Hoses or other methods of transportation furnished by Contractor.

H. Topsoil: Refer to Section 329119 – Topsoil.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine finish surfaces, grades, topsoil quality and depth. Do not start sodding work until unsatisfactory conditions are corrected.

3.2 PREPARATION:

A. Limit preparation to areas which will be immediately sodded. Spread topsoil, fine grade.

B. Treat lawn areas with "Round Up" by Monsanto, per label directions as required to kill existing vegetation prior to sodding.

C. Loosen topsoil of lawn areas to minimum depth of 3". Remove stones over 1" in any dimension and sticks, roots, rubbish and extraneous matter. (In athletic fields remove stones over 1/2” in any dimension. Refer to Section 329119 – Topsoil.)

D. Grade lawn areas to smooth, free draining and even surface with a loose, and uniformly fine texture. Roll and rake; remove ridges and fill depressions as required to drain.

E. Apply amendments as indicated by soil test, with rotary or drop spreader and incorporate in top 3 inches of soil. Soil test results must be forwarded to landscape architect.

F. Apply starter fertilizer at a rate to provide sustained fertility of .15 - .2 lbs. N per 1000 sf per week for 10-16 weeks. Available manufacturer (Polyon) or approved equal. Starter fertilizer may be part of phosphorus and potassium needs as indicated by soil test.

G. Dampen dry soil prior to sodding.

H. Restore prepared area to specified condition if eroded, settled or otherwise disturbed after fine grading and prior to sodding.

3.3 INSTALLATION:

A. Lay sod to form a solid mass with tightly-fitted joints. Butt ends and sides of sod strips. Do not overlay edges. Stagger strips to offset joints in adjacent course. Remove excess sod to avoid smothering of adjacent grass. Provide sod pad top flush with adjacent curbs, sidewalks, drains and seeded areas.

B. Do not lay dormant sod or install sod on saturated or frozen soil.

C. Install initial row of sod in a straight line, beginning at bottom of slopes, perpendicular to direction of the sloped area. Place subsequent rows parallel to and lightly against previously installed row.

D. Peg sod on slopes greater than 3 to 1 to prevent slippage at a rate of 2 stakes per yard of sod.

E. Water sod thoroughly with a fine spray immediately after laying.

F. Roll with light lawn roller to ensure contact with sub-grade.

G. Sod indicated areas within contract limits and areas adjoining contract limits disturbed as a result of construction operations.

3.4 MAINTENANCE:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

3.5 ACCEPTANCE:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

3.6 CLEANING:

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris and equipment. Repair damage resulting from sodding operations.

END OF SECTION 329223

SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Attention is directed to Bidding and Contract Requirements, and to General and Supplemental Conditions hereby made a part of this Section.

1.2 DESCRIPTION OF WORK:

A. Extent of trees, shrubs and ground covers is shown on drawing and by provisions of this Section.

B. Type of Work Required Includes the Following:

1. Soil preparation
2. Trees, shrubs and ground covers
3. Planting mixes
4. Mulch and planting accessories
5. Soil percolation tests

C. Related Work Specified Elsewhere:

1. Section 320536: Landscape Maintenance and Warranty Standards
2. Section 329119: Topsoil
3. Section 329223: Sodding

1.3 SUBMITTALS:

A. Submit the Following Material Samples:

1. Hardwood shredded bark mulch.
2. Trees must be approved by 1 of 2 options at the discretion of the Owner’s Representative:
    a. Owner’s representative field tag.
    b. Photographs of representative material. Trees not meeting the quality of approved representative sample will be rejected.
3. One (1) gallon bag of plant mixture with approved topsoil compost blend.

B. Submit the Following Materials Certification:

1. Topsoil source and test report.
2. Plant fertilizer.
3. Compost test results.

1.4 QUALITY ASSURANCE:

A. Plant names indicated; comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade. Provide stock true to botanical name and legibly tagged.

B. Comply with sizing and grading standards of the latest edition of “American Standard for Nursery Stock." A plant shall be dimensioned as it stands in its natural position.

C. All plants shall come from nurseries located in Zones 4 - 6 of the USDA Hardiness Zone Map unless approved by the Landscape Architect.

D. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work.

E. Provide percolation testing by filling plant pits with water and monitoring length of time for water to completely percolate into soil. Submit test results to Owner’s Representative prior to starting work.

1.5 DELIVERY, STORAGE AND HANDLING:

A. Deliver fertilizer materials in original, unopened and undamaged containers showing weight, analysis and name of manufacturer. Store in manner to prevent wetting and deterioration.

B. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. Spray deciduous plants in foliage with an approved "Anti-Dessicant" immediately after digging to prevent dehydration. Dig, pack, transport and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock and on arrival. A copy of certificate shall be filed with the Owner’s Representative. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss or in a manner acceptable to the Owner’s Representative. Water heeled-in plantings as required to keep root system moist until planting. No plant shall be bound with rope or wire in a manner that could damage or break the branches.

C. Cover plants transported on open vehicles with a protective covering to prevent windburn.

D. Frozen or muddy topsoil is not acceptable.

1.6 PROJECT CONDITIONS:

A. Work Notification: Notify Owner’s Representative at least 7 working days prior to installation of plant material.

B. Protect existing utilities, paving and other facilities from damage caused by landscaping operations. See AIA General Conditions.

C. A complete list of plants, including a schedule of sizes, quantities and other requirements is shown on the proposal form. In the event that quantity discrepancies or material omissions occur in the proposal form, Contractor shall notify the Owner’s Representative during the proposal bidding process.

D. Locate, protect and maintain the existing irrigation system main lines during construction. Repair irrigation system components, damaged during planting operations, at this Contractor’s expense.

E. Perform percolation testing.

F. Verify availability of on-site water.

G. Concealed contingencies. Refer to AIA General Conditions.

1.7 WARRANTY:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Plants - General: Provide plants typical of their species or variety; with densely developed branches and vigorous, fibrous root systems free of insects and diseases and have a fully developed form without voids and open spaces. Plants shall be lush, without dry foliage or root balls, free of defects, disfiguring knots, sunscald, wind burn, broken branches, frost cracks or abrasions.

1. Balled and burlapped plants shall have natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the "American Standard for Nursery Stock".
2. Cracked or mushroomed balls will not be accepted.
3. Trees to have clay or clay loam balls.
4. Sandy loam or sandy balls will not be accepted.
5. Plants planted in rows shall be matched in form, size, height and branching habit.
6. Plants larger than those specified in the plant list may be used when acceptable to the Owner's Representative. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.
7. No pruning wounds shall be present with a diameter of more than 1" and such wounds must show vigorous bark on all edges.
8. Shrubs and small plants shall meet the requirements for spread and height indicated on the proposal form.

B. All single trunk deciduous trees (including specimen stock), shade or ornamental trees, shall have straight trunks of healthy condition without mechanical damage, splits, frost cracks, scars, free of insects or disease.

1. Trees must have a straight central leader through crown of tree.
2. "V" crotch branching will not be accepted.
3. Tree crown to be uniform, symmetrical, plumb and characteristic of species.

C. All Evergreen trees (including specimen stock) shall have straight trunks of healthy condition without mechanical damage, splits, frost cracks, scars, free of insects or disease.

1. Trees must have a straight central leader from base to top of tree.
2. "V" crotch branching will not be accepted.
3. Trees to be uniform, symmetrical and plumb.
4. Trees must be unsheared and fully branched to ground.

D. Provide "specimen" plants with a special height, shape or character of growth. Landscape Contractor to tag specimen trees or shrubs at the source of supply. The Owner's Representative will inspect specimen selections at the source of supply for suitability and adaptability to selected location. When specimen plants cannot be purchased locally, provide sufficient photographs of the proposed specimen plants for approval. The Landscape Contractor shall inspect all plant material at source prior to Owner's Representative's review.

Landscape Contractor shall accompany Owner's Representative to nursery on final selection trip (if required).

E. Container-Grown Stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.

1. No plants shall be loose in the container.
2. Container stock shall not be root bound.
3. The measurements for height shall be taken from the ground level to the average height of the top of the plant and not the longest branch.
4. Single stemmed or thin plants will not be accepted.
5. Side branches shall be generous, well twigged and the plant as a whole well bushed to the ground.
6. Plants shall be in a moist, vigorous condition, free from dead wood, bruises or other root or branch injuries.

F. Specimen Stock: All specimen designated plantings are to be nursery grown, fully developed, excellent quality and typical example of the species. Plants designated to be planted in rows must be matched, symmetrical and uniform in height, spread, caliper and branching density.

1. Matched plantings should be obtained from same nursery and, preferably, from same row or line. All specimen material will be approved by Owner's Representative at nursery.

G. Topsoil for Planting Mix: Refer to Section 329119 - Topsoil.

H. Peat Moss: Brown to black in color, weed and seed free granulated raw peat.

1. Provide ASTM D-2607 sphagnum peat moss with a PH below 6.0 for ericaceous plants.

I. Planting Mixture Type A (for shrubs and ornamental grasses): Standard planting backfill shall be a mixture of 3/4 topsoil, 1/4 compost. Add fertilizer Type "A" or as indicated by soil test to planting mixture per manufacturer's requirements. Follow planting details.

J. Planting Mixture Type B (for perennials, ground cover beds and Ericaceous plants): Planting backfill shall be a mixture of 3/4 topsoil, 1/4 compost. Adding fertilizer type "B" or as indicated by soil test to mixture per manufacturer requirements. Follow planting details.

K. Plant Fertilizer shall be:

1. Legal and acceptable in the local community of the project and shall not be harmful to the public or wildlife when applied per manufacturer's instructions.
2. Slow-release, SCU or IBDU fertilizers for turf, flowerbeds, and deep-root feeding shall be used unless approved otherwise.
3. Turf, shrub, or tree fertilizer used shall contain low or no phosphate unless soil tests indicate soil is deficient in this nutrient.

Fertilizer Type A with micronutrients to be applied at a NPK ratio of 4-1-2. Provide 1 lb of actual nitrogen per 1,000 sf unless the soil test recommendations indicate otherwise.

Fertilizer Type B with micronutrients to be applied at a NPK ratio of 1-2-1. Provide 2 lbs of actual nitrogen per 1,000 sf unless the soil recommendations indicate otherwise.

L. "MyCor" Tree Saver Soil Conditioner manufactured by Plant Health Care, Inc., (800) 421-9051. Use for all tree and shrub species except Rhododendrons, Azaleas and Laurels.

M. Superphosphate: Composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than eighteen (18%) percent available phosphoric acid. Apply as required based upon soil test report.

N. Compost: The compost shall be a mature/stabilized, humus-like material derived from the aerobic decomposition of yard clippings or other materials as designated compostable as defined in Part 115 of Act 451 of 1994 as amended in Act 212 dated 2007, and shall be in compliance with all federal and state laws. The compost shall have a dark brown or black color, be capable of supporting plant growth without ongoing addition of fertilizers or other soil amendments and shall not have an objectionable odor. It shall be free of plastic, glass, metal and other physical contaminants, as well as viable weed seeds and other plant parts capable of reproducing (except airborne weed species). The compost moisture content shall be such that no visible free water or dust is produced when handling it.

Test Items	Acceptable Range
Maturity/Stabilization:	An acceptable test that can demonstrate Maturity/Stability
Temperature:	The material must have undergone the procedure to significantly reduce the pathogen level as referenced in EPA 40 CFR, Part 257 Regulations, Federal Register Vol. 58, No. 32; dated 2/19/93; Rules and Regulations; (Pile temperatures must be maintained at 40 degrees C for 5 days with a temperature exceeding 55 degrees C for at least 4 hours).
Pathogens and Trace:	Shall meet the requirements of EPA 40 CFR, Part 503 *TCLP or Elements EPA 1311 Regulations, Federal Register Vol. 58, No. 32; dated 2/19/93; Rules and Regulations.
Organic Content:	30-65%, dry weight basis
Moisture Content:	30-60%, wet weight basis
Inert Contamination:	Less than 1% by weight (no visible plastic, glass or metal allowed)
Soluble Salts:	1 – 7.5 mmho
Carbon:Nitrogen Ratio:	10:1 to 20:1
pH:	6 to 7.5
Particle Size:	98% pass through 3/4” screen or smaller

A compost sample shall be submitted to the Owner for approval prior to being used.

O. Lime: Ground dolomitic limestone, ninety-five (95%) percent passing through #100 mesh screen. Use to adjust soil pH only, under direction of Landscape Architect or based upon soil test report.

P. Sand: Clean, coarse, ungraded conforming to ASTM C-3 for fine aggregates.

Q. Anti-Dessicant: Protective film emulsion providing a protective film over plant surfaces; permeable to permit transpiration. Mixed and applied in accordance with manufacturer's instructions.

R. Double Processed Hardwood Shredded Bark Mulch: Dark brown non-dyed in color, clean, free of debris and sticks, and well aerated. Materials shall be uniform in size, shape and texture. Recycled wood products, such as “pallet mulch,” shall not be used. Submit samples for approval prior to installation.

S. Water: Free of substances harmful to plant growth. Hoses or other methods of transportation furnished by Contractor.

T. Stakes for Staking: Hardwood or green metal T-section posts without anchor plates, 2" x 2" x 6'-0" minimum length.

U. Stakes for Guying: Hardwood, 2 x 4 nominal, x 24” length, pointed on one end.

V. Guying/Staking Wire: New galvanized steel wire, free of kinks or bends, use 11 gauge for trees 4” caliper or 8’ height and under; use 9 gauge for larger trees.

W. Turnbuckles: Galvanized steel of size and gauge required to provide tensile strength equal to that of the wire. Turnbuckle opening shall be at least 3”.

X. Staking and Guying Hose: Two-ply, 3/4” black reinforced garden hose not less than 1/2" inside diameter.

Y. Tree Wrap: Standard waterproofed tree wrapping paper, 2-1/2" wide, made of 2 layers of crepe kraft paper weighing not less than 30 lbs. per ream, cemented together with asphalt.

Z. Twine: Two-ply jute material.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine proposed planting areas and conditions of installation. Do not start planting work until unsatisfactory conditions are corrected.

3.2 PREPARATION:

A. Time of Planting:

1. Evergreen Material: Plant evergreen materials between August 15 and October 1 or in spring before new growth begins. If project requirements require planting at other times, plants shall be sprayed with anti-dessicant prior to planting operations.
2. Deciduous Material: Dig deciduous materials in a dormant condition. If deciduous trees are dug in-leaf, they shall be sprayed with an anti-dessicant prior to planting operation.
3. Planting times other than those indicated must be acceptable to the Owner’s Representative.

B. Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor.

C. Individual plant locations shall be staked on the project site by the Contractor and approved by the Owner's Representative before any planting pits are dug. The Owner reserves the right to adjust plant material locations to meet field conditions, without additional cost to the Owner.

D. Planting pits shall be round, with vertical sides and flat bottoms and sized in accordance with outlines and dimensions shown on the planting details.

E. Accurately stake plant material according to the drawings. Stakes shall be above grade and painted a bright color to be clearly visible for inspection.

F. If obstructions are encountered that are not indicated, do not proceed with planting operations until alternative plant locations have been selected and approved in writing by the Owner's Representative. Where location or spacing dimensions are not clearly shown, request clarification by the Owner's Representative.

G. See drawings for planting details.

H. Vegetation Removal:

1. Strip existing grass and weeds, including roots, from all bed areas, till and fine grade existing topsoil, leaving the soil surface one-inch below finished grade (in areas shown on plan).
2. Herbicide: Use Round Up (Monsanto Co.) as required to prepare areas for new planting, applied to all ground cover, evergreen and shrubbery beds and all mulch areas before application of pre-emergence herbicide, per manufacturer's recommendations. Clean area of all dead material after five (5) days.
3. Pre-Emergence Herbicide: DACTHAL W-75 (Diamond Shamrock Agricultural Chemicals) applied to one (1) ounce per l00 square feet to same area where "Herbicide" has been applied and after area is cleared of dead vegetation.
4. Herbicides to be applied by Licensed Applicator as required by the State.

3.3 INSTALLATION:

A. Excavate circular plant pits with vertical sides, except for plants specifically indicated to be planted in beds. Provide plant pits per planting details. Depth of pit shall accommodate the root system. Scarify the bottom of the pit to a depth of 4".

B. Provide pre-mixed planting mixture Type "A" for use around the balls and roots of all deciduous and evergreen tree plantings in planters. Trees planted in earth shall be backfilled with native soil per planting details unless noted otherwise.

C. Beds for Ground Cover, Flowers, Ericaceous Plants and Ornamental Grasses: Excavate existing soil to 12" depth over entire bed area and remove soil from site. Set plants according to drawings and backfill entire bed with pre-mixed planting mixture Type "B".

D. Mass Shrub Beds/Hedge Beds: Excavate existing soil to 18" depth over entire bed area and remove soil from site. Scarify bottom of the bed to a 4" depth. Set plants according to drawings and specifications, and backfill entire bed with (pre-mixed) specified planting mixture Type "A".

E. Planting:

1. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb and faced to give the best appearance or relationship to each other or adjacent

structure. Set plant material 2"-3" above the finish grade. No filling will be permitted around trunks or stems. Backfill the pit with planting mixture. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water in non-irrigated areas.

2. After balled and burlapped plants are set, muddle planting soil mixture around bases of balls and fill all voids. Sufficiently compact to prevent settlement.
3. Add “MyCor” Tree Saver to mix per manufacturer’s directions.
4. Remove all burlap, ropes and wires from the tops of balls.
5. Space ground cover plants in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 12" of the trunks of trees and shrubs within planting bed and to within 6" of edge of bed.
6. Spread and arrange roots of bare-rooted plants in their natural position. Work-in planting mixture. Do not mat roots together. Cut all broken and frayed roots before installing planting mixture.
7. Water immediately after planting.

F. Mulching:

1. Mulch tree and shrub planting pits and shrub beds with required mulching material depths per details immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.

G. Wrapping, Guying, Staking:

1. Inspect trees for injury to trunks, evidence of insect infestation and improper pruning before wrapping.
2. Wrap trunks of all trees spirally from bottom to top with specified tree wrap and secure in place.
3. Stake/guy all trees immediately after lawn seeding or sodding operations and prior to acceptance. When high winds or other conditions which may effect tree survival or appearance occur, the Architect shall require immediate staking/guying.
4. Stake deciduous trees 4" caliper and under. Stake evergreen trees 8’-0” height and under. Use two (2) stakes for each tree per details.
5. Guy deciduous trees over 4" caliper. Guy evergreen trees over 8’-0” height. Use three (3) guys per tree.

H. Pruning:

1. Prune branches of deciduous stock, after planting, to balance the loss of roots and preserve the natural character appropriate to the particular plant requirements. Remove or cut back broken, damaged and unsymmetrical growth of new wood.
2. Multiple Leader Plants: Preserve the leader which will best promote the symmetry of the plant. Cut branches flush with the branch collar. Make cut on an angle.
3. Prune evergreen trees only to remove broken or damaged branches.

3.4 MAINTENANCE:

A. Refer to Section 320536 – Landscape Maintenance and Warranty Standards.

3.5 CLEANING:

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soil, debris and equipment. Repair damage resulting from planting operations.

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END OF SECTION 329300