SPECIFICATIONS

EAST MARTELLO DRAINAGE AND PARKING IMPROVEMENTS

Prepared for

MONROE COUNTY BOARD OF COUNTY COMMISSIONERS

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SECTION 31 11 00- CLEARING AND GRUBBING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for clearing and grubbing.

B. Related Requirements:

1. Section 312200 – Finish Grading.

1.02 DEFINITIONS

A. Clearing: Cutting, removal, and proper disposal of trees, stumps, brush, shrubs, rubbish, and other material as required to construct improvements shown and specified.

B. Grubbing: Removal and disposal of stumps larger than 1-1/2-inch in diameter and other similar items to a depth of not less than 12 inches below finish grade.

1.03 SYSTEM DESCRIPTION

A. Clear and grub project site as shown on the Drawings and specified in this Section.

B. Clear and grub project site as required to complete project.

1.04 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.

1.05 PROJECT CONDITIONS

A. Site Information: Data in the subsurface investigation report was used for the basis of the design. The report is available for review. Conditions are not intended as representations or warranties of accuracy or continuity between soil. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.

B. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner's Representative and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner's Representative not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Owner's Representative's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

D. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.01 CLEARING AND GRUBBING

A. Clear and grub areas to be occupied by facilities to be constructed, including areas to be excavated, filled, paved, or planted as shown on the Drawings.

B. Clear and grub as required to complete project. Clear and grub easements as required to complete project. Do not clear or grub more than required to complete project.

C. Existing palm trees on project site shall be removed and relocated to a site within the Owner's property as designated by the Owner.

3.02 PROTECTION OF ADJACENT AREA

A. Protect areas shown on the Drawings or designated by the Engineer to remain protected from damage by construction operations by erecting suitable barriers or other acceptable means.

B. Areas outside limits of construction as shown on the Drawings shall be protected and no equipment or materials shall be stored on these areas or allowed to damage these areas.

3.03 DISPOSAL

A. Remove roots, vegetation, and other debris from the site daily. Dispose of roots, vegetation, and other debris removed from the site at no cost to the owner.

B. Do not burn any material on the site or other areas where burning is not permitted.

3.04 SOIL MATERIALS

B. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

C. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, SW, and SP, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

D. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, GM, SC, SM, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

E. Backfill and Fill: Satisfactory soil materials.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 97 percent passing a 3-inch sieve and not more than 5 percent passing a No. 200 sieve.

G. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

H. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

I. Clear and strip all surface vegetation, topsoil, roots, grass, organics, structures, appurtenances, pavements, and other deleterious material. Depth of removal is anticipated to be on the order of 6 inches or less.

J. Proof-roll soils at the stripped surface areas with a minimum of 10 passes (30% overlap with preceding pass) of a heavyweight vibratory drum roller (minimum impact force of 20,000 pounds per drum to the soil). Any areas that yield during the proof-rolling operation or areas of deleterious material that are exposed during proof-rolling operation shall be over excavated, compacted, and replaced with compacted satisfactory material. Satisfactory material shall be placed in lifts not exceeding 12 inches in loose thickness. Thoroughly compact each lift with the vibratory roller. Prior to compaction, document condition of adjacent structures. Compaction shall cease if deemed harmful to adjacent structures. Compaction with a non-vibratory drum roller may be required to protect adjacent structures.

END OF SECTION

SECTION 31 22 00 FINISH GRADING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Replacement of top soil and finish grading.

B. Related Requirements:

1. Section 31 11 00 – Clearing and Grubbing
2. Section 31 23 00 – Excavation and Fill
3. Section 32 12 16 – Asphalt Paving

1.02 DEFINITIONS

A. The phrase "DOT Specifications" shall refer to the most current Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

1.03 PROJECT CONDITIONS

A. Protect above and below grade utilities that remain.

B. Protect plants, lawns, and other features to remain as a portion of final landscaping.

C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from grading equipment and vehicular traffic.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Topsoil: ASTM D 2487 soil classification groups GW, GP, SW, and SP, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, vegetation, and other deleterious matter.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that bench mark and intended elevations for the work are as indicated.

3.02 PREPARATION

A. Stake and flag locations of known utilities.

B. Identify required lines, levels, contours, and datum.

C. Protect site features that are to remain.

3.03 FINISH GRADING

A. Before Finish Grading:

1. Verify building and trench backfilling have been inspected.
2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size.

C. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

D. Place topsoil in areas where seeding, sodding, and planting are indicated.

E. Place topsoil to the following compacted thicknesses:
1. Areas to be Sodded: 6 inches.
2. Shrub Beds: 18 inches.
3. Flower Beds: 12 inches.

F. Place topsoil during dry weather.

G. Remove roots, weeds, rocks, and foreign material while spreading.

H. Near plants spread topsoil manually to prevent damage.

I. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

J. Lightly compact placed topsoil.

3.04 CLEANING

A. Leave site clean and raked; ready to receive landscaping.

END OF SECTION

SECTION 31 23 00 – EXCAVATION AND FILL

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for excavation, and backfilling of trenches.

B. Related Sections

1. Section 31 11 00 Clearing and Grubbing
2. Section 31 22 00 Finish Grading

C. Lump Sum Prices

1. Trenching and Backfilling

a. Trenching and backfilling for Work included in this project is included in the lump sum cost for work installed, unless otherwise stated herein, and the lump sum price for work includes trenching and backfilling in whatever nature of material may be encountered. No additional allowance to the lump sum price proposal by the Contractor for the project or any part thereof will be allowed on any claim for extra compensation because of trenching, backfilling, or trenching and backfilling being of a nature different from that contemplated by Contractor.

b. The Contractor is charged with the responsibility of actually investigating and examining the site of the project before preparing his proposal and satisfying himself in this respect.

1.02 REFERENCES

A. General: References to standards, specifications, manuals, or codes of any technical society, organization or association, or to the Laws or Regulations of any government authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of proposals (or, on the Effective Date of the Agreement if there were no proposals), except as may be otherwise specifically stated in the Contract Documents.

B. ANSI/ASTM Standards

1. ANSI/ASTM C33 Concrete Aggregates
2. ANSI/ASTM D1557Test Method for Laboratory Compaction Characteristics of Soil
(AASHTO T-180) Using Modified Effort (56,000 ft.-lbf/ft^3)(2,700 kN-m/m^3)

C. ASTM Standards

1. ASTM D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
2. ASTM D2487 Classification of Soils for Engineering Purposes
3. ASTM D2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Method (Shallow Depth)
4. ASTM D2937 Test Method for Density of Soil in Place by the Drive-Cylinder Method

F. Florida Department of Transportation (FDOT) Standards

1. Standard Specifications for Road and Bridge Construction

G. State of Florida

1. Florida Trench Safety Act (90-96, Laws of Florida)

H. Occupational Safety and Health Administration

1. Excavation Safety Standards, 29 C.F.R.s.1926.650 Subpart P.

1.03 DEFINITIONS

A. General: Soil classifications presented in this Article are applicable to natural soils and processed materials.

B. ASTM D2487 Unified Soil Classification System (USCS)

1. Class I: Angular, one-quarter inch (1/4") to one and one-half inch (1-1/2") graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed shells and crushed stone.

2. Class II: Coarse sands and gravels with maximum particle size of one and one-half inches (1-1/2"), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. The following soil types are included in this class:

a. GW (well-graded gravel)

b. GP (pea gravel or crushed stone mixed with sand)

c. SW (well-graded sand)

d. SP (poorly graded sands and gravelly sands with little or no fines)

3. Class III: Fine sand and clayey (clay filled) gravels, including fine sands, sand-clay mixture and gravel-clay mixtures. The following soil types are included in this class:

a. GM (silty gravels)

b. GC (clayey gravels)

c. SM (silty sands)

d. SC (clayey sands)

4. Class IV: Silt, silty clays and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. The following soil types are included in this class:

   a. CH (Inorganic clays of high plasticity)

   b. CL (Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays)

   c. MH (inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts)

   d. ML (Inorganic silts, very fine sands, rock flour, silty or clayey fine sands)

5. Class V: This class includes the following organic soils as well as soils containing frozen earth, debris, rocks larger than one and one-half inches (1-1/2") in diameter and other foreign materials:

   a. OL (Organic silts and organic silty clays of low plasticity)

   b. OH (Organic clays of medium to high plasticity)

   c. PT (Peat, muck, and other highly organic soils)

C. Maximum Density: Maximum weight in pounds per cubic foot of a specific material.

D. Optimum Moisture: Percentage of water in a specific material at maximum density.

E. Rock: A natural aggregate of mineral particles connected by strong and permanent cohesive forces. Rock includes:

1. Limestone, lime rock, sandstone, dolomite, granite marble, lava, and coral.

2. Boulders 1/3 cubic yard or more in volume.

3. Material which by actual demonstration cannot, in the Engineer's opinion, be reasonably excavated with a backhoe or 3/4 cubic yard capacity power shovel equipped with two rippers, or similarly approved equipment and which is, in fact, systematically drilled and blasted or broken by power operated hand tools. Engineer may waive demonstration requirement if material encountered is well-defined rock.

F. Deleterious Materials: Household and construction debris, organic debris, peat and organic soils,

1.04 SYSTEM DESCRIPTION

A. Perform excavation required to construct underground piping systems to lines and grades shown on the Drawings.

B. Provide, place, and compact pipe bedding and haunching as shown on the Drawings and specified in this Section.

C. Provide, place, and compact initial fill as shown on the Drawings and specified in this Section.

D. Provide, place, and compact final fill as shown on the Drawings and specified in this Section.

E. Place, compact, and test fill as specified in this Section.

F. Dispose of unsuitable and excess excavated material as specified in this Section.

G. Grade final fill to elevations, lines, slopes, depths and cross-sections shown on the Drawings. Where no change in finish grade is indicated, grade final fill to elevations, lines, slopes, depths and cross-sections that existed prior to start of construction.

1.05 QUALITY ASSURANCE

A. General: Trenching and backfilling shall be performed by company with not less than five years of documented experience in underground utility construction.

B. Soils Testing

1. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspection.

   A. For additional requirements, refer to Section 007200 – General Conditions and Section 007300 – Supplementary Conditions.

2. Schedule trenching and backfilling to permit a reasonable time for testing before placing succeeding lifts of installing pipe.

3. Keep testing laboratory informed of structural earthwork progress.

C. General Monitoring: Trenching and backfilling shall be monitored on a periodic basis by the independent testing laboratory for general compliance with the intent of these specifications.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall be responsible for delivery, storage, and handling of fill material from off-site sources.

B. Comply with requirements of Federal, State, and County authorities regulating shipment of products.

C. Contractor shall be responsible for storage and handling of on-site excavated suitable fill material.

D. Do not allow fill material from off-site sources or on-site excavated suitable fill material to be mixed with unsuitable material.

E. Do not allow stored fill material from off-site sources to be mixed with stored on-site excavated suitable fill material.

F. Protect stored fill materials so that the composition of materials is not altered and materials are not otherwise degraded or contaminated.

G. Prevent erosion of soil and fill materials and sedimentation of waterways, open drainage ways and storm and sanitary sewers due to construction activities.

1.07 PROJECT/SITE CONDITIONS

A. Regulatory Requirements

1. Conform to Federal and State regulatory requirements for excavations.

2. Obtain excavation permit prior to starting trenching and backfilling. Conform to requirements of excavation permit.

3. Provide barricades, warning signs, and lights as required by law, regulation, or law and regulation.

B. Excavation Protection

1. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.

2. Grade top perimeter of trench to prevent surface water run off into trench.

C. Protection of Adjacent Improvements

1. Underpin adjacent structures and utilities, including utility services, which may be damaged by excavation work.

2. Repair damaged structures, utilities, or structures and utilities at no additional cost to the Owner.

D. Protection of Benchmarks, Monuments, and Other Reference Points

1. Maintain benchmarks, monuments, and other reference points.

2. Retain a Registered Land Surveyor who shall establish, for any benchmarks, monuments, and other reference points that might be disturbed by structural earthwork, references that will not be disturbed.

3. Registered Land Surveyor shall replace benchmarks, monuments, and other reference points removed or otherwise disturbed.

E. Unanticipated Conditions

1. Notify Engineer of unexpected subsurface conditions and discontinue work in affected area until notified by Engineer to resume work.

2. Take emergency measures as required to protect persons and improvements.

PART 2 – PRODUCTS

2.01 SOURCE FOR BEDDING AND FILL MATERIALS

A. Use excavated materials that meet the requirements specified in this Section.

B. Furnish and install imported material if excavated material does meet the requirements of this Section.

C. Excess excavated material that meets the requirements of this Section shall be stored at the project site until backfilling is completed. Do remove excess excavated material that meets the requirements of this Section from the project site until backfilling is completed.

2.02 BEDDING

A. Crushed Stone Bedding: Imported, graded stone meeting the requirements of Class I soil with maximum particle size equal to one-half inch (1/2").

1. Size range and resulting high void ration of crushed stone bedding material makes it suitable for use to dewater trenches during pipe installation.

2. The permeable characteristic of crushed stone dictates that use of crushed stone bedding material be limited to locations where pipe support will not be lost by migration of fine grained natural material from trench walls and bottom or migration of other embedment materials into crushed stone bedding material.

3. When migration of fine grained natural material into crushed stone bedding is possible, minimum size range of crushed stone bedding shall be reduced to finer than one-quarter inch (1/4"), and gradation shall be selected to limit the size of the voids.

4. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration to fines.)

B. Coarse Sand and Gravel Bedding: Coarse sands and gravels meeting the requirements of Class II soil with maximum particle size equal to three-quarter inch (3/4") and with less than five percent fines.

1. Coarse-grained soils with less than 12 percent but more than five percent fines may be used for coarse sand and gravel bedding if approved by the Engineer.

2. Gradation of coarse sand and gravel bedding material influences density and pipe support strength of coarse sand and gravel when bedding material is loosely placed. Gradation of coarse sand and gravel bedding material may be critical to the pipe support and stability of the foundation and embedment, if the material is imported and is not native to the trench excavation. Gradation other than well graded, such as uniformly graded or gap graded, may permit loss of support by migration into void spaces of a finer grained natural material from the trench wall and bottom.

3. When migration of fine grained natural material into coarse sand and gravel bedding is possible, adjust gradation of bedding material to limit size of voids so there is no migration of fines from trench walls or trench bottom into bedding material.

4. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration of fines.

2.03 HAUNCHING

A. Haunching material shall be on-site or imported non-cohesive, non-plastic material free of debris and gravel larger than one-half inch in diameter.

B. Haunching materials shall be Class I or Class II soils as defined in this Section.

2.04 SELECT FILL

A. Select fill shall be on-site or imported non-cohesive, non-plastic material free of debris and gravel larger than one-half inch in diameter.

B. Select initial and final fill materials shall be Class I or Class II soils as defined in this Section.

2.05 COMMON FILL

A. Common fill shall be on-site or imported non-cohesive, non-plastic material, free of debris and rocks larger than six inches in diameter.

B. Common initial fill materials shall be Class I, Class II, or Class III soils as defined in this Section.

C. Common final fill materials shall be Class I, Class II, Class III or acceptable dry, native Class IV soils as defined in this Section.

PART 3 – EXECUTION

3.01 INSPECTION OF SOURCE FOR BEDDING AND FILL MATERIALS

A. Verify approval of full or limited use of stockpiled fill.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Prior to trenching, cut or score pavement to straight edges, six inches outside each edge of the proposed trench. Do not damage pavement not removed.

3.03 EXCAVATION

A. Dewater trenches as specified in Section 02240 Dewatering.

B. Excavate trench so that piping can be installed to alignment and depth shown on the Drawings and as specified.

C. Trench width shall be ample to permit piping to be laid and jointed properly. Minimum trench width shall be at least three feet, six inches or eight inches greater than the largest outside diameter of the pipe or bell, whichever is greater.

D. If sheeting is used, sheeting may be removed provided removal can be accomplished without disturbing bedding, pipe or alignment. Should Engineer determine that removal of sheeting will damage pipe, sheeting shall be left in place at no additional cost to the Owner. If left in place, cut sheeting off two feet above top of pipe and leave sheeting in place below cut. Any damage to pipe bedding, pipe, or alignment caused by removal of sheeting shall be cause for rejection of the affected portion of the Work.

E. Open no more than 100 feet of trench ahead of pipe laying operations at one time unless a greater length of trench is approved by the Engineer.

3.04 TRENCH BOTTOM

A. Excavate trench to elevation required for pipe material.

1. For piping that does not require bedding below bottom of pipe, excavate trench to bottom of pipe.

2. For piping that requires bedding below bottom of pipe, excavate trench to bottom of bedding below pipe.

B. Soil surface at trench bottom shall provide a firm, stable and uniform support for pipe. Soil surface at trench bottom shall be free of any protrusions which may cause point loading on any portion of pipe or bell.

C. Do not over-excavate trench bottom if trench bottom material is stable undisturbed soil of the follow types:

1. Class II soil including types GW, GP, SW and SP.
2. Class III soil including types GM, GC, SM and SC.
3. Class IV soil including types CL and ML.

D. Do not bed pipe on solid rock, boulders, hardpan, unsuitable soils, organic material, or other materials that are not suitable for trench bottom. Remove soils and other materials that are not suitable materials for trench bottom. Remove soils and other materials that are not suitable materials for trench bottom to six inches under pipe, minimum.

1. Remove wet, yielding, or mucky soils. Remove the following soils:
   a. Type CH and Type MH Class IV soils.
   b. All Class V soils.
2. Remove organic material including roots, mulch, or other vegetable matter, which in the opinion of the Engineer, will result in unsatisfactory foundation conditions.
3. Remove soils containing cobbles, boulders or stones larger than one and one-half inches (1-1/2") in diameter.
4. Remove ledge rock and hardpan. Remove rock and hardpan to provide bedding width 24 inches wider than pipe.
5. Remove soils containing rubbish, trash, or other foreign materials.

E. Replace ledge rock, hard pan, boulders, unsuitable soils, and soil containing material that is not suitable for trench bottom.

1. Over-excavation Replacement for Piping that Does Not Require Bedding below Bottom of Pipe
   a. If trench is over-excavated more than six inches below the bottom of the pipe, but less than twelve inches below the bottom of the pipe, fill and compact over-excavation with acceptable Class I, II or III soil as defined in this Section.
   b. If trench is over-excavated more than twelve inches below bottom of pipe, fill and compact over-excavation with crushed stone bedding.
2. Over-excavation Replacement for Piping that Requires Bedding below Bottom of Pipe: Fill and compact over-excavation to bottom of bedding with Class I soil as defined in this Section.

3.05 BEDDING

A. General: Properly bed pipelines, conduits and appurtenances as shown on Drawings and as specified in this Section.

B. Bedding for PVC Pipe: Place and compact crushed stone bedding from a minimum of 1/4 diameter of pipe below invert of pipe to bottom of pipe.

C. Bedding for Ductile Iron Pipe

1. If trench bottom at bottom of pipe is Class I, Class II, Class III or acceptable dry, native Class IV soils as defined in this Section, bed pipe on trench bottom.

2. If trench bottom is not acceptable for bedding, place crushed stone bedding or coarse sand and gravel bedding from a minimum of l/4 diameter of pipe below invert of pipe up to bottom of pipe.

D. Preparation of Trench Bottom for Piping and Conditions that Do Not Require Bedding below Bottom of Pipe

1. Compact trench bottom as required to achieve density specified for bedding, haunching, and backfill. Minimum compaction for trench bottom shall be 90% of Modified Proctor Maximum Dry density (ASTM D1557).

2. Bring trench bottom to grade prior to installation of pipe, fittings, and valves. Bring trench bottom to grade along entire length of pipe.

E. Preparation of Trench Bottom for Piping or Conditions that Require Bedding below Bottom of Pipe

1. Excavate trench bottom and place bedding material, so that bedding grade is correct following compaction of bedding.

2. Uniformly compact bedding. Use hand or mechanical tamping to compact bedding material.

3. Compact bedding material as required to achieve density specified for haunching and backfill. Minimum compaction of bedding material shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557).

4. Bring bedding material to grade prior to installation of pipe, fittings, and valves. Bring bedding material to grade along entire length of pipe.

3.06 HAUNCHING

A. Haunching for PVC Pipe: Place crushed stone bedding material from top of bedding to spring line (centerline) of pipe.

B. Haunching for Ductile Iron Pipe

1. If trench bottom at bottom of pipe is Class I, Class II, Class III or acceptable dry, native Class IV soils as defined in this Section, place haunching material from trench bottom to spring line (centerline) of pipe.

2. If trench bottom is not acceptable for bedding, place crushed stone bedding or coarse sand and gravel bedding material from top of bedding up to 1/8 diameter of pipe. Place haunching material from top of crushed stone bedding or coarse sand bedding material to spring line (centerline) of pipe.

C. Piping Support: Support piping during placement and compaction of haunching.

D. Placing Haunching Material

1. Do not place haunching over porous, wet, or spongy trench bottom or bedding material.

2. Hand place haunching material.

3. Place haunching evenly along both sides of pipe, fittings, and valves so that equal load is maintained along both sides of pipe, fittings, and valves.

4. Work haunching under pipe, fittings, and valves so that there are no voids in fill and so that pipe, fittings, and valves are properly supported.

5. Place haunching so that piping materials, coatings, and encasement are not damaged.

E. Haunching Material Compaction

1. Compact haunching material

2. Compact haunching so that pipe, fittings, and valves are properly supported.

3. Compact haunching as required to achieve density specified for backfill material.

4. Minimum compaction of haunching shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557).

3.07 INITIAL BACKFILL

A. Initial backfill shall extend from the top of haunching to one foot above top of pipe. Placement of initial backfill may be either by hand or mechanical means.

B. Initial fill in trenches wholly or partially beneath paved areas as follows shall be select initial fill:

1. Public streets, roads, and parking areas.
2. Institutional roads, drives, and parking areas.
3. Commercial roads, drives, and parking areas.

C. Initial fill in trenches beneath unimproved areas, lawns, landscaping, private drives, and private parking areas shall be common initial fill unless otherwise shown on the Drawings.

D. Keep initial backfill free from debris, rocks, clods, and other items larger than one-half inch (1/2").

E. Do not compact initial fill directly over pipe, fittings, or valves until adequate cover has been provided to prevent damage to pipe, fitting, or valve. Adequate cover will depend on piping materials and type of compaction equipment used. Adequate cover shall be as accepted by the Engineer.

F. Minimum compaction of initial fill shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557).

3.08 FINAL BACKFILL

A. Backfill trenches to contours and elevations shown on drawings, or to match existing grade if finish grade is not changed.

B. Final backfill in trenches wholly or partially beneath paved areas as follows shall be select initial fill:

1. Public streets, roads, and parking areas.
2. Institutional roads, drives, and parking areas.
3. Commercial roads, drives, and parking areas.

C. Final backfill in trenches beneath unimproved areas, lawns, landscaping, private drives, and private parking areas shall be common initial fill unless otherwise shown on the Drawings.

D. Backfill trench systematically, as early as possible, to allow maximum time for natural settlement.

E. Place and compact select fill material in continuous layers not exceeding 6 inches in depth. Minimum compaction of select fill shall be 98% of Modified Proctor Maximum Dry density (ASTM D1557). Compaction of select fill shall be by small portable plate compactor or other approved method.

F. Place and compact common fill material in continuous layers not exceeding 12 inches in depth. Minimum compaction of common fill shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557). Compaction of common fill shall be by mechanical means or other approved methods.

3.09 COMPACTION

A. Compaction Equipment

1. Compaction shall be accomplished by use of appropriate compaction equipment.

2. Compact each lift by repeated passes of appropriate compaction equipment.

3. Select and operate compaction equipment so that pipe and structures are not damaged by compaction operation.

B. Moisture Control

1. Control moisture content of soil during compaction as required to achieve specified compaction.

2. Moisture content of fill and backfill material shall be within plus or minus 2% of optimum moisture content during compaction of fill and backfill material.

3. If necessary, add water or allow material to dry until the proper moisture content for the specified compaction is obtained.

C. Compaction Testing

1. Test compaction of bedding, haunching, initial backfill, and final backfill as specified in this Section.

2. Test each compacted soil layer, in place, prior to placement of succeeding layers.

3.10 TESTING

A. Retain a laboratory approved by Engineer to make field density tests and Proctor Tests as specified below.
   1. Contractor shall pay the cost of initial density test(s).
   2. Contractor shall pay cost for any additional testing required as a result of failure of any initial test.

B. Perform one Proctor Test, according to ASTM D1557, for each source of fill used on the Project. If material from excavation is used as backfill material, take a test proctor from the best available location as determined by the testing lab.

C. Determine Optimum moisture content of fill, subgrade, and backfill material by Modified Proctor Method (ASTM D1557).

D. Test the density of compacted bedding, haunching, and initial fill. Test the density of each compacted final fill layer in place. Field density tests shall meet the requirements of ASTM D1556, ASTM D2922, or ASTM D2937.

E. Perform density tests for initial backfill and final backfill as follows:

1. Initial Backfill — 1 test per layer for each 300 foot length of trench (minimum 1 test per day)

2. Select Final Backfill — 1 test per layer for each 300 foot length of trench (minimum 1 test per day)

3. Common Final Backfill: 1 test for each 1,000 feet of trench.

F. Perform additional field density tests as follows:

1. If test density of compacted backfill or fill is less than specified density, make additional tests at locations directed by Engineer.

2. Make additional field density tests at no additional cost to the Owner.

G. Allow for inspection of import fill by Engineer at the source before delivery to site.

3.11 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL

A. Remove unsuitable material and excess excavated suitable material from the Project.

B. Dispose of unsuitable material and excess excavated suitable material off of the Project.

END OF SECTION

SECTION 31 25 00 EROSION AND SEDIMENTATION CONTROLS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for erosion and sedimentation control.

1.02 DEFINITIONS

A. The phrase "DOT Specifications" shall refer to the most current Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

1.03 SYSTEM DESCRIPTION

A. Obtain permits required by regulatory authorities having jurisdiction and required by the Owner for installation, maintenance, and removal of erosion and sedimentation control measures.

B. Furnish and install erosion and sedimentation control measures.

C. Provide labor, equipment, and services required to maintain erosion and sedimentation control measures.

D. Remove erosion and sedimentation control measures that are not a permanent part of Work.

1.04 SUBMITTALS

A. General: As specified in:

1. Division 1;
2. This Section

B. Submit copy of Erosion Control Plan prior to installing erosion and sedimentation control measures.

C. Submit erosion and sedimentation control plan approved by State, local, or State and local authorities.

1.05 PROJECT/SITE CONDITIONS

A. Regulatory Requirements

1. Dewatering

a. Obtain permit, or permits, for erosion and sedimentation control for earthwork and dewatering. Make application and arrangements and pay fees and charges for permit, or permits.

b. Obtain permit, or permits, for erosion and sedimentation control prior to starting earthwork. Obtain permit, or permits, for erosion and sedimentation control prior to installing dewatering system, or systems.

c. Comply with requirements of permits for erosion and sedimentation control.

2. Stormwater Pollution Prevention Plan

a. Prepare "Notice of Intent to Use Generic Permit for Stormwater Discharge from Construction Activities that Disturb Five or More Acres of Land". Submit application and pay fee for review and approval of Notice.

b. Obtain response to Notice prior to starting construction.

c. Comply with requirements of Stormwater Pollution Prevention Plan and Generic Permit for Stormwater Discharge from Construction Activities that Disturb Five or More Acres, including modifications, addenda, and additions by Federal, State, and County regulatory authorities having jurisdiction.

PART 2 – PRODUCTS

2.01 MATERIALS FOR EROSION AND SEDIMENT CONTROL

A. Filter Fabric

1. Filter Fabric Material: Nylon, polyester, propylene or ethylene yarn with ultraviolet ray inhibitors and stabilizers conforming to Section 985 of the DOT Specifications.

2. Filter Fabric Flow: 0.3 gallons per foot per minute, minimum.

B. Sediment Fence Posts

1. Post Material: Pine
2. Post Diameter: four inches
3. Post Length: Four feet, minimum.

C. Spillway Section Stone: Class "B" erosion control stone.

D. Stone Installed on Inside Spillway Face for Drainage Control: No. 67 washed stone conforming to Section 901 of the DOT Specifications.

PART 3 – EXECUTION

3.01 EROSION CONTROL PLAN

A. Excavation method shall be selected by the Contractor, unless otherwise shown on the Drawings or required by local regulations

B. Contractor shall be responsible for erosion and sedimentation control.

C. Prepare and submit an Erosion Control Plan based upon the proposed excavation method.

D. Erosion Control Plan shall be reviewed and accepted by the Engineer prior to commencement of any land disrupting activities. Erosion Control Plan shall be reviewed and accepted by State, local, or State and local authorities having jurisdiction over erosion and sedimentation control prior commencement of any land disrupting activities.

E. Submit erosion and sedimentation control plan approved by State, local, or State and local authorities.

3.02 LOCATION

A. The type of sedimentation and erosion control (SEC) devices to be employed on the project will depend on location and adjoining features of the land at that location.

B. Construct SEC devices in accordance with approved Erosion Control Plan.

3.03 TEMPORARY SEDIMENT TRAP CONSTRUCTION

A. Clear, grub and strip area under embankment of vegetation and root mat.

B. Clear retention area to elevation as approved by Engineer.

C. Use fill material free of roots, woody vegetation and organic matter. Place fill in lifts not to exceed nine inches. Machine compact fill.

D. Construct dam and stone spillway to dimensions, slopes and elevations shown on approved permit, or approved permit drawings.

E. Construct spillway crest level (± 0.05 feet) and at least 18 inches below top of dam at all points.

F. Extend stone outlet section to vegetated road ditch on zero grade with top elevation of stone level with bottom of drain.

G. Construct top of dam six inches above natural surrounding ground, minimum.

H. Stabilize embankment and disturbed area above sediment pools as shown in vegetation plan.

3.04 SEDIMENT FENCE CONSTRUCTION

A. Locate sediment fence down-slope from source of sediment. Extend sediment fence around source of sediment so that all run-off from source of sediment flows through sediment fence.

B. Set posts down-slope of fabric.

C. Bury toe of fence approximately eight inches deep.

D. When joints are necessary, securely fasten fabric at support post with overlap to next post.

3.05 SILTATION AND BANK EROSION

A. Take adequate precautions to minimize siltation and bank erosion in crossing canals or ditches, in discharging well point systems, or during other construction activities.

END OF SECTION

SECTION 32 12 16 ASPHALT PAVING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: This section covers the work necessary for the construction of the Asphalt / Pavement.

1. Type SP- 9.5..... 9.5 mm

1.02 REFERENCES; FDOT LOCAL AGENCY SPECIFICATIONS (LAP) AND STANDARD SPECIFICATIONS / LOCAL AGENCY SPECIFICATIONS

A. The term "Standard Specifications" is used; such reference shall mean the most current edition of Florida Department of Transportation Standard Specification for Road and Bridge Construction and LAP Specifications. The Standard Specifications shall be considered as part of this section of the Specifications; below are Listed references for the contractor's convenience; the contractor shall be responsible for obtaining and incorporation in the contract all of the Standard Specification's and the most current revisions that apply to this contract scope of work. The contractor shall document in his daily reports the required Standard Specifications that are used.

B. Reference(s):

1. SECTION 334 HOT MIX ASPHALT FOR LOCAL AGENCIES
2. SECTION 120 EARTHWORH AND RELATED OPERATIONS FOR LOCAL AGENCIES
3. SECTION 710 PAINTED PAVEMENT MARKINGS
4. SECTION 711 THERMOPLASTIC TRAFFIC STRIPES AND MARKINGS
5. 911 LIMEROCK MATERIAL FOR BASE AND STABILIZED BASE
6. SECTION 971 TRAFFIC MARKING MATERIALS

C. Any reference of the "FDOT", "Agency" "Engineer" 'Local Agency" in the LAP SPECS, and "Standard Specifications" shall be considered to be the Owner (City of Key West) for this contract. LAP SPECS are available at:

http://www.dot.state.fl.us/specificationsoffice/Implemented/LAP/LapSpecs/Default.shtm

1.03 DEFINITIONS

A. The phrase "FDOT Specifications" shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

1.04 SYSTEM DESCRIPTION

A. Furnish and install asphaltic concrete pavement as shown on the Drawings and specified in this Section. Furnish and install asphaltic concrete pavement in accordance with the lines, grades and typical section as indicated on the Drawings.

B. Furnish and install new asphaltic concrete pavement required to complete the paving work.

C. Furnish and install asphaltic concrete topping as indicated on the Drawings.

D. Repair asphaltic concrete pavement damaged as a result of completing Work and damaged by construction operations.

1.05 SUBMITTALS

A. General: As specified in:

1. Division 1;

2. This Section

B. Submit proposed formula for asphaltic concrete paving prior to starting pavement work.

1.06 QUALITY ASSURANCE

A. FDOT Specifications referred to in this Section are made a part of this Contract to the extent of such references, and shall be as binding upon the Contract as through reproduced herein in their entirety.

1.07 DELIVERY, STORAGE, AND HANDLING

A. General

1. Product Delivery: As specified in Section 01650 Product Delivery Requirements.

2. Product Storage and Handling: As specified in Section 01660 Product Storage and Handling.

B. Asphaltic Concrete Pavement Materials: Delivery, storage, and handling of asphaltic concrete pavement materials shall meet the requirements of FDOT LAP / Specifications.

1.08 PROJECT/SITE CONDITIONS

A. Environmental Requirements

1. Do not place base, prime coat, tack coat, or asphaltic concrete when rain is falling or when there is water on the surface to be covered.

2. Monitor climatic conditions and anticipate conditions producing rainfall.

3. Remove and replace materials damaged by rainfall or standing water.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Lime Rock Base: Lime Rock base shall be in accordance with Section 911 of the FDOT Specifications.

B. Soil-Cement Base: Soil Cement base shall be in accordance with Section 270 of the FDOT Specifications.

C. Prime Coat: Material used for prime coat shall be cut-back Asphalt Grade RC-70 conforming to Sections 300 and 916 of the FDOT Specifications for prime to be used on Miami Oolite formation lime rock.

D. Tack Coat: Material used for tack coat shall be Emulsified Asphalt Grade RS-2 conforming to Sections 300 and 916 of the FDOT Specifications. All areas to be paved shall receive a final tack coat that provides a uniform finish for new and existing paving.

E. Asphaltic Concrete: Materials and construction of asphaltic concrete patch and surface courses shall be Type SP-9.5

PART 3 – EXECUTION

3.01 INSTALLATION

A. Subgrade

1. Stabilize roadway subgrades to the minimum depth shown on the Drawings to a Limerock Bearing Ratio of not less than 40. Stabilizing shall be Type B as defined in Section 160 of the FDOT Specifications. Stabilization may require addition and thorough mixing in of crushed limerock, course limerock screenings, or any other stabilizing material acceptable to the Engineer. Apply stabilizing material in such quantity that, after mixing and blending, the subgrade will have a LBR of not less than 40. Mix, blend, or mix and blend stabilizing material into subgrade material by plowing, scarifying, disking, harrowing, blading and mixing with rotary tillers until mixed materials are of uniform bearing value throughout width and depth of layer being processed.

2. Make not less than three density determinations on each day's final compaction operations on each course. Make density determinations at more frequent intervals if deemed necessary by the Engineer.

B. Base

1. Construct Base in accordance with Section 230 of the FDOT Specifications, to the thickness and width indicated on the Drawings.

2. After spreading of the base material is completed, scarify entire surface and shape surface to produce the exact grade and cross section after compaction. For double course base, extend scarifying to a depth sufficient to penetrate slightly the surface of the first course. The maximum depth of each lift shall be 8 inches.

3. When the material does not have the proper moisture content to insure the required density, wetting or drying shall be required.

    a. If the material is deficient in moisture, add and uniformly mix in water by disking the base course to the full depth of the base course.

    b. If the material contains an excess of moisture, allow the material to dry to proper moisture content before compacting material.

4. As soon as proper conditions of moisture are attained, compact material to an average density not less than 98 percent maximum density as determined in more than one course, the density shall be obtained in each lift of the base.

5. During final compacting operations, if blading of any areas is necessary to obtain true grade and cross section, complete compacting operations for such areas prior to making density determination on finished base.

6. Unless otherwise directed by the Engineer, “hard-plane” the surface with a blade grader immediately prior to the application of the prime coat to remove the thin glaze or cemented surface and to allow free penetration of the prime material. Materials planed from the base shall be removed from base area.

7. If cracks or checks appear in the base, either before or after priming, which in the opinion of the Engineer, would impair the structural efficiency of the base course, remove such cracks or checks by rescarifying, reshaping, adding base material where necessary and recompacting, at no additional cost to the Owner.

8. If at any time the subgrade material shall become mixed with the base course material, dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean base material. Shape and compact clean base material as specified in this Article. Remove, replace, shape, and compact material at no additional cost to the Owner.

C. Prime Coat: Apply prime coat at a rate of 0.15 gallons per square yard, and perform the Work in accordance with Section 300 of the FDOT Specifications.

D. Tack Coat: Apply tack coat at a rate between 0.02 and 0.10 gallons per square yard, and perform the Work in accordance with Section 300 of the FDOT Specifications.

E. Asphaltic Concrete: Spreading, compact, and joint the wearing surface in accordance with Sections 330, 332, 333 of the FDOT Specifications to the thickness indicated on the Drawings.

3.02 PAVEMENT REPAIR

A. Repair damage to pavement as a result of Work under this Contract. Repair damage to pavement in a manner satisfactory to the Engineer and at no additional cost to the Owner. Pavement repair shall include preparation of the subgrade, placing and compacting of the limerock base, priming of the base, and placing and maintaining of surface treatment, as specified in this Section.

B. Width of repairs shall extend at least 12 inches beyond the limit of damage. Edge of pavement to be left in place shall be cut to a true edge with a saw or other acceptable method that provides a clean edge to abut repair. Line of the repair shall be reasonably uniform with no unnecessary irregularities.

END OF SECTION

SECTION 32 16 00 SIDEWALKS, CURBS & GUTTERS

PART 1- GENERAL

1.1 WORK INCLUDED: This section covers all formed concrete work reinforced and non-reinforced as required by the Project indicated on the plans or specified by the Engineer. **The Contractor is responsible for all site work and construction supervision required to meet ADAAG/ADA specifications when placing concrete.**

1.2 SUBMITTALS DURING CONSTRUCTION:

A. Submittal during construction shall be made as required in General Requirements.

1.3 SUBMITTALS REQUIRED FOR:

A. Concrete - Submit data sheets

B. Granular fill - Submit data sheets

C. Expansion joint fillers - Submit data sheets

D. Traffic paint - Submit data sheets

E. Asphalt concrete cold patch - submit data sheets

F. Asphalt Hot Mix – submit data sheets

G. Sod - submit data sheets

H. Stamped and Colored concrete-submit data sheets

I. Detectable Warnings System:- submit data sheets

J. Concrete Sealer - submit data sheets

PART 2- PRODUCTS

2.1 FORMS:

A. Materials for curb forms shall be 2-inch dressed dimension lumber, fiberglass, or metal of equal strength, free from defects which would impair the appearance or structural quality of the complete curb. Where short-radius forms are required, 1-inch dressed lumber or plywood may be used. Form material for the face of the curb shall not have any horizontal joints closer than 7-inches from the top of the curb. Provide stakes and

bracing materials as required to hold forms securely in place. Metal forms shall be subject to approval by the Engineer. Forms are incidental to the Contract Price.

B. Materials for sidewalk forms shall be 2-inch dressed lumber straight and free from defects or fiberglass or standard metal forms may be used. Where short radius forms are required, 1-inch dressed lumber is required to hold forms securely in place.

2.2 GRANULAR FILL:

A. Natural sand not having any piece of material larger than 1-inch, free from dirt, clay balls, or organic material, well graded from coarse to fine, containing sufficient finer material for proper compaction and less than ten (10) percent by weight passing the No. 200 sieve. Payment shall incidental to the concrete unit Price bid.

2.3 EARTH FILL:

A. Earth must be free from rocks 2-inches or larger and other foreign materials. Earth fill is incidental to contract Prices. Payment shall incidental to the concrete unit Price bid.

2.4 EXPANSION JOINT FILLERS:

A. Expansion joint fillers shall conform to F.D.O.T. Standard Specifications for Road and Bridge Construction 2004. Submit complete information regarding joint fillers for approval by the Engineer. Payment shall incidental to the concrete unit Price bid.

2.5 CONCRETE:

A. Concrete shall be ready-mixed conforming to ASTM C 94 and shall have a compressive strength of 3,000 psi at 28 days. All exposed aggregate concrete applications shall be comprised of 3 MM – 5 MM maximum size brown river rock aggregate. Limerock aggregate is acceptable for all other concrete applications. Submit complete information regarding mix to the Engineer for review in accordance with the requirements of the referenced ASTM Specification.

2.6 DETECTABLE WARNING SYSTEM:

A. Detectable Warning Systems on walking surfaces shall be “Endicott Handicap Detectable Warning Paver” or equal with raised truncated domes and specified color and must meet federal ADAAG guidelines.

2.7 TRAFFIC MARKING PAINT:

A. Traffic marking paint shall conform to F.D.O.T. Specifications Section 971. Paint for curbs shall be Pride Baker Paint brand traffic marking paint or approved equal. Paint and labor shall be incidental to contract price for replacement markings and the unit price bid for new markings.

2.8 ASPHALT:

A. Cold patch asphalt. Asphalt and labor shall be incidental to the contract price for patches surrounding curbs and sidewalks.

2.9 ACCEPTANCE OF MATERIALS:

A. All materials shall be subject to inspection for suitability, as the Engineer may elect, Prior to or during incorporation into the work.

PART 3- EXECUTION

3.1 EXCAVATION AND BACKFILL:

A. Cut the existing sidewalk regardless of the thickness, with an approved pavement saw or approved pavement cutter wherever sidewalk edges do not follow straight lines. Saw cutting of concrete shall be wet down to reduce air borne contamination. Remove and dispose of sidewalk at the Contractor's expense.

B. Prior to excavation of the sidewalk the Contractor's superintendent and the Owner's Engineer or designee shall, together, walk the length of the site marking the limits of the excavation and marking any other pertinent information. Paint shall be supplied by the Contractor, incidental to the cost of the Contract.

C. As directed by the Engineer remove any unsuitable material to such a depth that the addition of the sub grade and granular fill can be placed and compacted. Unsuitable material shall consist of and not be limited to top soil, wood, root matter, stumps, trunks, roots or root systems. Excavation that cannot be accomplished without endangering present structures shall be performed with hand tools.

3.2 PREPARATION OF SUBGRADE:

A. Bring the areas on which curbs and sidewalks are to be constructed to required grade and compact to 95 percent ASTM D 1557 by sprinkling and rolling or mechanical tamping. As depressions occur, refill with approved material and recompact until the surface is at the proper grade.

3.3 PLACING GRANULAR FILL:

A. After the sub grade for sidewalks and curbs is compacted and at the Proper grade, spread 4-inches or more of granular fill. Sprinkle with water and compact to 95 percent ASTM D 1557 by rolling or other method. Top of the compacted fill shall be at the proper level to receive the concrete. Granular fill shall be used, when needed, to raise the level of grade to allow for proper thickness of concrete. After spreading fill, compact to 95 per cent.

3.4 SETTING FORMS:

A. Construct forms to the shape, lines, grades, and dimensions as required for proper installation or as called for on the drawings or as directed by the Engineer. Stake wood or steel forms securely in place, true to line and grade.

B. Forms on the face of the curb shall not have any horizontal joints within seven (7) inches of the top of the curb. Brace forms to prevent change of shape or movement in any direction resulting from the weight of the concrete during placement. Construct short-radius forms to exact radius. Tops of forms shall not depart from grade line more than 1/8-inch when checked with a ten-foot straightedge. Alignment of straight sections shall not vary more than 1/8-inch in ten (10) feet.

3.5 CURB/GUTTER CONSTRUCTION:

A. Construct curbs to line and grade of curbs and gutters removed, as shown on plans or as established or directed by the Engineer. Curbs shall conform to F.D.O.T. type "D" or "F" or as directed by the Engineer.

B. Handicap ramps shall be constructed at locations shown on the drawings or as directed by the Engineer and in conformance with legal requirements.

C. Place preformed asphalt-impregnated expansion joints at intervals not exceeding 100 feet, at the beginning and ends of the curved portions of the curbs and at inlets.

D. Place contraction joints in the curb at intervals not exceeding fifteen (15) feet. Contraction joints shall be of the open joint type and shall be Provided by inserting a thin, oiled steel sheet vertically into the fresh concrete to force coarse aggregate away from the joint. The steel sheet shall be inserted the full depth of the curb. Place, process, finish and cure concrete in conformance with the applicable requirements of ACI 614, and this Specification. Whenever the requirements differ, the higher shall govern. After initial set has occurred in the concrete and prior to removing the front curb form, the steel sheet shall be removed with a sawing motion. Finish top of curb with a steel trowel and finish edges with a steel edging tool.

E. As soon as the concrete has set sufficiently to support its own weight, remove the front form and finish all exposed surfaces. Finish formed face by rubbing with a burlap sack or similar device that will produce a uniformly textured surface, free of form marks, honeycombs and other defects. All defective concrete shall be removed and replaced at the Contractor's sole expense.

F. Upon completion of the curing period, backfill the curb with earth, free from rocks 2-inches and larger and other foreign materials. Tamp backfill firmly in place.

G. Finished curb shall present a uniform appearance for both grade and alignment. Remove any section of curb showing abrupt changes in alignment or grade, or which is more than 1/4-inch away from its location as staked, and construct new curb in its place at the Contractor's sole expense.

H. Upon completion of the curing period fill with asphalt any street side holes or ruts in the asphalt paving that was created by the installation of the sidewalk or the curb. When required by Engineer, saw cut, remove and replace sections as directed.

I. Where curbs that were painted for legal traffic markings (i.e., loading zones, driveways, no parking zones) prior to construction are removed, replaced, repaired or installed. These and any newly constructed curbs and sidewalks shall be repainted by the Contractor. Painting shall be performed upon completion of the curing period, but not less than seven (7) days have elapsed since pouring the concrete. Curbs are to be painted from the inside edge of the curb to the edge of the pavement.

3.6 SIDEWALK CONSTRUCTION:

A. Sidewalks shall be four-inches and driveways shall be 6 inches thick as directed by the Owner.

B. Place preformed expansion joints as in the adjacent curb, where the sidewalk ends at a curb, around posts, poles, concrete buildings or walls or other objects protruding through the sidewalk, and at locations shown on the Drawings.

C. Provide dummy joints transversely to the walks at locations opposite the contraction joints in the curb and at intervals not exceeding five (5) feet. These joints shall be 1/4-inch by 1-inch weakened plane joints. They shall be straight and at right angles to the surface of the walk.

D. Place, process, finish, and cure concrete in conformance with the applicable requirements of ACI 614 and this Specification. Where the requirements differ, the higher shall govern.

E. Surface finish shall be as depicted on the Landscape Drawings.

F. Sidewalks shall be placed to slope towards the street at a maximum slope of 2% or as otherwise directed by the Engineer.

G. Where sidewalks or curbs which were painted for legal traffic markings (i.e., loading zone, driveways, no parking zones) are removed and replaced with new curb or sidewalk or repaired, the Contractor shall be responsible to paint the new portions of the curbs or sidewalks.

H. Upon completion of the curing period fill with asphalt, any street side holes or ruts in the asphalt paving that were created by the installation of the curbs or sidewalks.

END OF SECTION

SECTION 33 40 00 STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.01 SUMMARY

A. The work includes storm drain pipe, culverts and structures in accordance with the lines, grades and details shown on the drawings.

1.02 SUBMITTALS

A. Submit certification that materials supplied are as specified.
B. As-builts / Record Drawings required for permit certification shall be provided by the contractor. As-Builts / Record Drawings shall include the following:

1. All pipe inverts elevations, bottom of structures elevation, pipe grade, LF of new pipe installed;
2. All rim elevations. All grate elevations.
3. Locations of Catch basins, Well structures, and Manholes.
4. Limits of construction.
5. Submit record drawings (four) 1 full size 3 11 x 17 signed and sealed by a Surveyor currently licensed in the State of Florida. Provide to the owner three DISCS with electronic copies in AUTOCAD and PDF.

1.03 REFERENCE STANDARDS

A. The Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, referred to hereafter as the Standard Specification. References to the Standard Specifications are used to specify materials, application and installation. Administrative, contractual and measurement and payment requirements are not applicable.

PART 2 - PRODUCTS

2.01 PIPE FOR CULVERTS AND UNDERDRAINS

A. ADS PIPE N-12

B. Provide ADS Pipe Adapter flexible watertight Waterstop connection with pipe adapter for ADS Corrugated HDPE Pipe to storm structures, or approved equal ADS Pipe Adapters meeting the requirements of ASTM F 2510 and ASTM C 1478 for watertight flexible connections. Rapid set mortar shall be used with potable water; ground water shall not be used.

2.02 JOINT MATERIALS FOR PIPE

A. Concrete pipe in accordance with Paragraph 430-7 of the Standard Specifications.

2.03 MITERED END SECTION

A. In accordance with FDOT Roadway and Traffic Design Standards - Index No. 272.

2.04 FILTER AGGREGATE FOR UNDERDRAINS

A. In accordance with Paragraph 902-4 of the Standard Specifications.

2.05 MATERIALS FOR INLETS, MANHOLES, JUNCTION BOXES, ENDWALLS, FLUMES, DITCH PAVEMENT, AND BOX CULVERTS

A. Concrete structures shall meet the requirements of FDOT 400; Concrete structures. All structures shall be H-20 rated

2.06 PRECAST INLETS, MANHOLES AND JUNCTION BOXES

A. In accordance with Paragraph 425-5 of the Standard Specifications and FDOT Roadway and Traffic Design Standards - Index No. 201.

2.7 PRECAST BAFFLE BOX SECTIONS

A. Precast manhole sections shall size shall be as specified on the drawings, conforming to ASTM C478. Precast sections shall meet the permeability test requirements of ASTM C14. Minimum wall thickness top, bottom, and sides shall be 8 inches. All manholes shall have epoxy-coated reinforcing bars. Reinforcing bars shall be 3” minimum from the edge. Top and bottom of all sections shall be parallel. The Contractor's attention is directed to Paragraph MORTAR herein before. Baffle Boxed shall support H20 loading.

2.8 MANHOLE AND BAFFLE BOX EXTENSIONS

A. Concrete grade rings shall be H-20 rated and for extensions shall be a maximum of 6 inches high and shall be approved by Engineer before installation.

B. HDPE adjustment rings shall be H-20 Rated and shall be approved by Engineer before installation

C. Clay Brick and Shale Brick. This brick shall meet the requirements of AASHTO M 114, for Grade MW. and shall be approved by Engineer before installation

D. Concrete Brick. Concrete brick shall meet the requirements of ASTM C 55 for Grade S-I, and shall be approved by Engineer before installation

1. In general, manhole and baffle box extensions will be used on all manholes in roads or streets or in other locations where a subsequent change in existing grade may be likely. Extensions will be limited to a maximum height of 12 inches. Finish grade for manhole covers shall conform to finished ground or street surface unless otherwise directed by the Engineer. The Contractor will be responsible for coordinating with the Engineer and Owner to determine the finish grade for manhole and baffle box covers and will make all adjustments necessary to bring manhole covers to that grade. Extensions shall lined with polypropylene and be watertight. Extensions shall meet the H-20 load rating; brick is used contractor is required to submit a shop drawing with an 18 inch concrete collar 4000 PSI 1-6 inches thick. Brick shall be installed using Rapid Set Mortar Mix or equal. This cost shall be incidental to the cost of installing the structure. Masonry unit's manufacturer shall submit six test certificates furnished to the Engineer. Such certificates shall be signed by an authorized agent of the manufacturer, and identified by project number.

2.9 BAFFLE BOX / MANHOLE FRAMES AND COVERS:

A. Cast iron of size and shape detailed on the Drawings. Covers shall have the word STORM SEWER, as appropriate, in 2-inch raised letters. Castings shall be tough, close-grained gray iron, sound, smooth, clean, free from blisters, blowholes, shrinkage, cold shuts, and all defects, and shall conform to ASTM A-48, Class 30B. Plane or grind bearing surfaces to ensure flat, true surfaces. Covers shall be true and seat within ring at all points.

2.10 WATERTIGHT

A. Provide water tight manhole ring and covers, and extensions.

B. Provide ADS Pipe Adapter flexible watertight Waterstop connection with pipe adapter for ADS Corrugated HDPE Pipe to storm structures, or approved equal ADS Pipe Adapters meeting the requirements of ASTM F 2510 and ASTM C 1478 for watertight flexible connections. Rapid set mortar shall be used with potable water; ground water shall not be used.

2.11 NUTRIENT SEPARATING BAFFLE BOX

A. Nutrient Separating Baffle Box and associated cage screen, skimmer, well screen, and turbulence deflectors, shall be as manufactured by Suntree Technologies, Inc., Cocoa, Fl.

B. Hydrocarbon boom shall be Type 4 Polymer Absorbent as specified by Suntree Technologies, Inc., Cocoa, Fl. or approved equal.

C. Baffle boxes requiring catch basin – frames and grates shall be USF # 4160-6611 galvanized; cost shall be included in the bidder's proposal. Note; all grates are required to be galvanized.

PART 3 - EXECUTION

3.01 INSTALLATION OF PIPE

A. Concrete pipe, in accordance with Paragraph 430-4 of the Standard Specifications.

B. Underdrains in accordance with Paragraphs 440-3, 440-4 and 440-5 of the Standard Specifications.

3.02 CONSTRUCTION OF INLETS, MANHOLES, JUNCTION BOXES, ENDWALLS, FLUMES, DITCH PAVEMENT, AND BOX CULVERTS

A. Placing concrete and reinforcing steel in accordance with Section 03300 - CONCRETE WORK.

B. Setting frames and grates in accordance with Paragraph 425-6.3 of the Standard Specifications.

C. Laying brick in accordance with Paragraph 425-6.5 of the Standard Specifications.

D. Placing pipe in accordance with Paragraph 425-6.6 of the Standard Specifications.

E. Concrete box culverts in accordance with Paragraphs 400-7.16, 400-9, and 415-5.11 of the Standard Specifications.

3.03 ADJUSTING EXISTING STRUCTURES

A. In accordance with Paragraph 425-6.8 of the Standard Specifications.

3.04 MITERED END SECTIONS

A. In accordance with FDOT Roadway and Traffic Design Standards - Index No. 272.

3.05 UNDERDRAINS

A. In accordance with Paragraphs 440-4 and 440-5 of the Standard Specifications.

3.06 SAND-CEMENT RIP-RAP ENDWALLS

A. In accordance with Paragraph 530-3.1 of the Standard Specifications.

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END OF SECTION