

## ADDENDUM #2

CR 466A Phase I (US Highway 27/441 to Sunny Court)  
Project No. 2016-02  
Bid No. 16-0017

This addendum is being issued to make the following changes, corrections, clarifications and additions to the bidding document. The information in this addendum modifies and changes the original bidding documents and takes precedence over the original documents. **Receipt of this addendum shall be acknowledged by the bidder by signing and dating the appropriate line on page W-4 of the bid proposal.** Failure to acknowledge this addendum may preclude consideration of the bid proposal for award.

1. **The Bid Opening date for this project has been extended to 10:00 a.m. on February 25, 2016.** As such, the question period has been extended until 5:00 p.m. on February 15, 2016. No oral interpretations will be made to any bidder as to the meaning of the Specifications, or any other Contract Documents. Every request for such an interpretation must be in writing, and shall be received by the Office of Procurement Services not less than ten (10) calendar days prior to the date set for opening of bids. Every interpretation made to a bidder will be made by an addendum to the Contract Documents, which, when issued, will be sent as promptly as is practicable to all persons to whom the Specifications have been issued by the County. All such addenda shall become part of the Contract Documents. No substitution of any kind or riders of any nature to the bids will be considered except by the above described method. For purposes of this Contract the term "Interpretations" shall include the approval of product substitution. All requests for interpretation shall be submitted to Susan Dugan, Senior Contracting Officer, at [sdugan@lakecountyfl.gov](mailto:sdugan@lakecountyfl.gov) and copied to Deb Marchese, Construction Program Specialist, at [dmarchese@lakecountyfl.gov](mailto:dmarchese@lakecountyfl.gov).
2. Contractor shall delete Sheet 35 of the construction plans in its entirety and replace with attached REVISED Sheet 35 titled Phasing Plan.
3. Contractor shall delete Section 28. Laboratory Testing within Division B (Page B-24) of the bidding document in its entirety and replace with the following: Contractor shall be responsible for all quality control laboratory testing in accordance with FDOT standards and specifications.

Contractor shall utilize the line item labeled Testing under the Roadway Construction portion of the bid tabulation form within Division W (Page W-5) of the bidding document for this cost.

4. Contractor shall bid to install Truncated Dome Warning Mats (liquid applied or cast-in-place) at all commercial driveways and side streets.
5. Contractor shall delete Sheets 13-15 and Sheets 20-22 of the construction plans in their entirety and replace with attached REVISED Sheets 13-15 and Sheets 20-22. These sheets reflect changes to the storm system to align within construction phasing.
6. Contractor shall bid to install rip rap that meets FDOT requirements at all mitered end sections.
7. Contractor shall bid to replace the existing chain link fence at the school to the new right of way line, matching the existing fencing type. Contractor shall utilize a blank space on the bid tabulation sheet and write in a new line item titled "Fence Installation at School" for this cost.
8. There is an existing 24" RCP pipe at approximately STA. 171+00 that will remain provided sufficient cover is maintained; however, if proper cover is not obtainable, Contractor shall remove the RCP as part of the clear and grub work.
9. Contractor shall include in their bid a cost to provide Lake County with a stormwater inspection video per FDOT requirements of all storm pipe installed as part of this project.
10. A NESHAP survey will be provided in Addendum #3 for the greenhouse that is located in the area of Pond #7.
11. Contractor shall delete Division J. Laboratory Testing and Sampling Schedule within the bidding document in its entirety and replace with the attached Off System LAP Specifications for the following:
  - Earthwork and Related Operations
  - Superpave Asphalt
  - Concrete
  - Landscape Installation

12. Attached and to be included within Division P. Permits of the bidding document are the following documents related to the City of Fruitland water and sewer lines:

- FDEP Water permit
- FDEP Sewer permit
- Technical Special Provisions



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Terry Scott, Construction Inspection Supervisor

1-29-16

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Date

**EARTHWORK AND RELATED OPERATIONS FOR LAP (OFF-SYSTEM).**  
**(REV 1-23-12) (FA 2-27-12)**

**SECTION 120**  
**EARTHWORK AND RELATED OPERATIONS FOR LAP (OFF-SYSTEM)**

**120-1 Description.**

**120-1.1 General:** Perform earthwork and related operations based on the type of work specified in the Contract and the Earthwork Categories as defined below. Meet the applicable requirements for materials, equipment and construction as specified.

Earthwork and related operations consists of excavation for the construction of the roadway, excavation for structures and pipe, constructing backfill around structures and pipe, and constructing embankments as required for the roadway, ditches, and channel changes.

**120-1.2 Earthwork Categories:** Performance of Earthwork Operations will fall into one of the following Earthwork Categories:

**120-1.2.1 Earthwork Category 1:** Includes the earthwork and related operations associated with the construction of sidewalks and bike paths along with any drainage structures associated with these facilities.

**120-1.2.2 Earthwork Category 2:** Includes the earthwork and related operations associated with the construction of turn lanes and other non-mainline traffic lanes, widening, roadway shoulders, concrete box culverts, retaining walls, and other drainage structures on the non-mainline pavement.

**120-1.2.3 Earthwork Category 3:** Includes the earthwork and related operations associated with the construction of new mainline pavement, along with concrete box culverts, retaining walls, and other drainage structures on the mainline pavement.

**120-2 Classes of Excavation.**

**120-2.1 Excavation of Unsuitable Material:** Excavation of unsuitable material consists of the removal of muck, clay, rock or any other material that is unsuitable in its original position and that is excavated below the finished grading template. For stabilized bases and sand bituminous road mixes, the finished grading template is the top of the finished base, shoulders and slopes. For all other bases and rigid pavement, the finished grading template is the finished shoulder and slope lines and bottom of completed base or rigid pavement.

**120-2.2 Lateral Ditch Excavation:** Lateral ditch excavation consists of all excavation of inlet and outlet ditches to structures and roadway, changes in channels of streams, and ditches parallel to the roadway right-of-way. Dress lateral ditches to the grade and cross-section shown in the plans.

**120-2.3 Channel Excavation:** Channel excavation consists of the excavation and satisfactory disposal of all materials from the limits of the channel as shown in the plans.

**120-2.4 Excavation for Structures and Pipe:** Excavation for structures consists of the excavation for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

### **120-3 Excavation Requirements.**

**120-3.1 Excavation and Replacement of Unsuitable Materials:** Where rock, muck, clay, or other material within the limits of the roadway is unsuitable in its original position, excavate such material to the cross-sections shown in the plans or indicated by the Engineer, and backfill with suitable material. Shape backfill materials to the required cross-sections. Where the removal of plastic soils below the finished earthwork grade is required, meet a construction tolerance of plus or minus 0.2 foot in depth and plus or minus 6 inches (each side) in width.

**120-3.2 Lateral Ditch Excavation:** Excavate inlet and outlet ditches to structures and roadway, changes in channels of streams and ditches parallel to the roadway. Dress lateral ditches to the grade and cross-section shown in the plans.

**120-3.3 Channel Excavation:** Excavate and dispose of all materials from the limits of the channel as shown in the plans. Excavate for bridge foundations, box culverts, pipe culverts, storm sewers and all other pipe lines, retaining walls, headwalls for pipe culverts and drains, catch basins, drop inlets, manholes, and similar structures.

#### **120-3.4 Excavation for Structures and Pipe.**

**120-3.4.1 Requirements for all Excavation:** Excavate foundation pits to permit the placing of the full widths and lengths of footings shown in the plans, with full horizontal beds. Do not round or undercut corners or edges of footings. Perform all excavation to foundation materials, satisfactory to the Engineer, regardless of the elevation shown on the plans. Perform all excavation in stream beds to a depth at least 4 feet below the permanent bed of the stream, unless a firm footing can be established on solid rock before such depth is reached, and excavate to such additional depth as may be necessary to eliminate any danger of undermining. Wherever rock bottom is secured, excavate in such manner as to allow the solid rock to be exposed and prepared in horizontal beds for receiving the masonry. Remove all loose and disintegrated rock or thin strata. Have the Engineer inspect and approve all foundation excavations prior to placing masonry.

#### **120-3.4.2 Earth Excavation:**

**120-3.4.2.1 Foundation Material other than the Rock:** When masonry is to rest on an excavated surface other than rock, take special care to avoid disturbing the bottom of the excavation, and do not remove the final foundation material to grade until just before placing the masonry. In case the foundation material is soft or mucky, the Engineer may require excavation to a greater depth and to backfill to grade with approved material.

**120-3.4.2.2 Foundation Piles:** Where foundation piles are used, complete the excavation of each pit before driving the piles. After the driving is completed, remove all loose and displaced material, leaving a smooth, solid, and level bed to receive the masonry.

**120-3.4.2.3 Removal of Obstructions:** Remove boulders, logs, or any unforeseen obstacles encountered in excavating.

**120-3.4.3 Rock Excavation:** Clean all rock and other hard foundation material, remove all loose material, and cut all rock to a firm surface. Either level, step vertically and horizontally, or serrate the rock, as may be directed by the Engineer. Clean out all seams, and fill them with concrete or mortar.

**120-3.4.4 Pipe Trench Excavation:** Excavate trenches for pipe culverts and storm sewers to the elevation of the bottom of the pipe and to a width sufficient to provide adequate working room. Remove soil not meeting the classification specified as suitable backfill material in 120-8.3.2.2 to a depth of 4 inches below the bottom of the pipe elevation. Remove rock, boulders or other hard lumpy or unyielding material to a depth of 12 inches below the

bottom of the pipe elevation. Remove muck or other soft material to a depth necessary to establish a firm foundation. Where the soils permit, ensure that the trench sides are vertical up to at least the mid-point of the pipe.

For pipe lines placed above the natural ground line, place and compact the embankment, prior to excavation of the trench, to an elevation at least 2 feet above the top of the pipe and to a width equal to four pipe diameters, and then excavate the trench to the required grade.

#### **120-4 Disposal of Surplus and Unsuitable Material.**

**120-4.1 Ownership of Excavated Materials:** Dispose of surplus and excavated materials as shown in the plans or, if the plans do not indicate the method of disposal, take ownership of the materials and dispose of them outside the right-of-way.

**120-4.2 Disposal of Muck on Side Slopes:** As an exception to the provisions of 120-4.1, when approved by the Engineer, muck (A-8 material) may be placed on the slopes, or stored alongside the roadway, provided there is a clear distance of at least 6 feet between the roadway grading limits and the muck, and the muck is dressed to present a neat appearance. In addition, this material may also be disposed of by placing it on the slopes where, in the opinion of the Engineer, this will result in an aesthetically pleasing appearance and will have no detrimental effect on the adjacent developments. Where the Engineer permits the disposal of muck or other unsuitable material inside the right-of-way limits, do not place such material in a manner which will impede the inflow or outfall of any channel or of side ditches. The Engineer will determine the limits adjacent to channels within which such materials may be disposed.

**120-4.3 Disposal of Paving Materials:** Unless otherwise noted, take ownership of paving materials, such as paving brick, asphalt block, concrete slab, sidewalk, curb and gutter, etc., excavated in the removal of existing pavements, and dispose of them outside the right-of-way. If the materials are to remain the property of the Agency, place them in neat piles as directed. Existing limerock base that is removed may be incorporated in the stabilized portion of the subgrade. If the construction sequence will allow, incorporate all existing limerock base into the project as allowed by the Contract Documents.

**120-4.4 Disposal Areas:** Where the Contract Documents require disposal of excavated materials outside the right-of-way, and the disposal area is not indicated in the Contract Documents, furnish the disposal area without additional compensation.

Provide areas for disposal of removed paving materials out of sight of the project and at least 300 feet from the nearest roadway right-of-way line of any road. If the materials are buried, disregard the 300 foot limitation.

#### **120-5 Materials for Embankment.**

**120-5.1 General Requirements for Embankment Materials:** Construct embankments using suitable materials excavated from the roadway or delivered to the jobsite from authorized borrow pits.

Construct the embankment using maximum particle sizes as follows:

In top 12 inches: 3 1/2 inches (in any dimension).

12 to 24 inches: 6 inches (in any dimension).

In the depth below 24 inches: not to exceed 12 inches (in any dimension)

or the compacted thickness of the layer being placed, whichever is less.

Spread all material so that the larger particles are separated from each other to minimize voids between them during compaction. Compact around these rocks in accordance with 120-7.2.

When and where approved by the Engineer, larger rocks (not to exceed 18 inches in any dimension) may be placed outside the one to two slope and at least 4 feet or more below the bottom of the base. Compact around these rocks to a firmness equal to that of the supporting soil. Where constructing embankments adjacent to bridge end bents or abutments, do not place rock larger than 3 1/2 inches in diameter within 3 feet of the location of any end-bent piling.

**120-5.2 Use of Materials Excavated From the Roadway and Appurtenances:** Assume responsibility for determining the suitability of excavated material for use on the project in accordance with the applicable Contract Documents. Consider the sequence of work and maintenance of traffic phasing in the determination of the availability of this material.

**120-5.3 Authorization for Use of Borrow:** Use borrow only when sufficient quantities of suitable material are not available from roadway and drainage excavation, to properly construct the embankment, subgrade, and shoulders, and to complete the backfilling of structures and pipe. Do not use borrow material until so ordered by the Engineer, and then only use material from approved borrow pits.

**120-5.3.1 Haul Routes for Borrow Pits:** Provide and maintain, at no expense to the Agency, all necessary roads for hauling the borrow material. Where borrow area haul roads or trails are used by others, do not cause such roads or trails to deteriorate in condition.

Arrange for the use of all non-public haul routes crossing the property of any railroad. Incur any expense for the use of such haul routes. Establish haul routes which will direct construction vehicles away from developed areas when feasible, and keep noise from hauling operations to a minimum. Advise the Engineer in writing of all proposed haul routes.

**120-5.3.2 Borrow Material for Shoulder Build-up:** When so indicated in the plans, furnish borrow material with a specific minimum bearing value, for building up of existing shoulders. Blend materials as necessary to achieve this specified minimum bearing value prior to placing the materials on the shoulders. Take samples of this borrow material at the pit or blended stockpile.

**120-5.4 Materials Used at Pipes, Culverts, etc.:** Construct embankments over and around pipes, culverts, and bridge foundations with selected materials.

## **120-6 Embankment Construction.**

**120-6.1 General:** Construct embankments in sections of not less than 300 feet in length or for the full length of the embankment.

### **120-6.2 Dry Fill Method:**

**120-6.2.1 General:** Construct embankments to meet compaction requirements in 120-7 and in accordance with the acceptance program requirements in 120-9. Restrict the compacted thickness of the last embankment lift to 6 inches maximum.

As far as practicable, distribute traffic over the work during the construction of embankments so as to cover the maximum area of the surface of each layer.

Construct embankment in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

#### **120-6.2.1.1 For A-3 and A-2-4 Materials with up to 15% fines:**

Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 12 inches. Ensure the percentage of fines passing the No. 200 US Standard sieve in the A-2-4 material does not exceed 15%.

**120-6.2.1.2 For A-1 Plastic materials (As designated in FDOT Design Standard Index 505) and A-2-4 Materials with greater than 15% fines:** Construct the embankment in successive layers with lifts up to a maximum compacted thickness of 6 inches.

**120-6.2.1.3 Equipment and Methods:** Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, sumps and siphons.

When normal dewatering does not adequately remove the water, the Engineer may require the embankment material to be placed in the water or in low swampy ground in accordance with 120-7.2.4.

**120-6.2.2 Placing in Unstable Areas:** Where depositing the material in water, or in low swampy ground that will not support the weight of hauling equipment, construct the embankment by dumping successive loads in a uniformly distributed layer of a thickness not greater than necessary to support the hauling equipment while placing subsequent layers. Once sufficient material has been placed so that the hauling equipment can be supported, construct the remaining portion of the embankment in layers in accordance with the applicable provisions of 120-7.2.4 and 120-7.2.6.

**120-6.2.3 Placing on Steep Slopes:** When constructing an embankment on a hillside sloping more than 20 degrees from the horizontal, before starting the fill, deeply plow or cut into steps the surface of the original ground on which the embankment is to be placed.

**120-6.2.4 Placing Outside Standard Minimum Slope:** Where material that is unsuitable for normal embankment construction is to be used in the embankment outside the standard minimum slope (approximately one to two), place such material in layers of not more than 18 inches in thickness, measured loose. The Contractor may also place material which is suitable for normal embankment, outside such standard minimum slope, in 18 inch layers. Maintain a constant thickness for suitable material placed within and outside the standard minimum slope, unless placing in a separate operation.

### **120-6.3 Hydraulic Method:**

**120-6.3.1 Method of Placing:** When the hydraulic method is used, as far as practicable, place all dredged material in its final position in the embankment by such method. Place and compact any dredged material that is re-handled, or moved and placed in its final position by any other method, as specified in 120-7.2. The Contractor may use baffles or any form of construction he may select, provided the slopes of the embankments are not steeper than indicated in the plans. Remove all timber used for temporary bulkheads or baffles from the embankment, and fill and thoroughly compact the holes thus formed. When placing fill on submerged land, construct dikes prior to beginning of dredging, and maintain the dikes throughout the dredging operation.

**120-6.3.2 Excess Material:** Do not use excess material placed outside the prescribed slopes, below the normal high-water level, to raise the fill. Remove only the portion of this material required for dressing the slopes.

**120-6.3.3 Protection of Openings in Embankment:** Leave openings in the embankments at the bridge sites. Remove any material which invades these openings or existing channels without additional compensation to provide the same depth of channel as existed before the construction of the embankment. Do not excavate or dredge any material within 200 feet of the toe of the proposed embankment.

## **120-7 Compaction Requirements.**

**120-7.1 Moisture Content:** Compact the materials at a moisture content such that the specified density can be attained. If necessary to attain the specified density, add water to the material, or lower the moisture content by manipulating the material or allowing it to dry, as is appropriate.

### **120-7.2 Compaction of Embankments:**

**120-7.2.1 Earthwork Category 1 and 2 Density Requirements:** The Engineer will accept a minimum density of 95% of the maximum density as determined by AASHTO T-99 Method C for all earthwork items requiring densities.

**120-7.2.2 Earthwork Category 3 Density Requirements:** The Engineer will accept a minimum of 100% of the maximum density as determined by AASHTO T-99 Method C for all densities required under category 3.

Except for embankments constructed by the hydraulic method as specified in 120-6.3, and for the material placed outside the standard minimum slope as specified in 120-6.2.4, and for other areas specifically excluded herein, compact each layer of the material used in the formation of embankments to the required density stated above. Uniformly compact each layer using equipment that will achieve the required density, and as compaction operations progress, shape and manipulate each layer as necessary to ensure uniform density throughout the embankment.

**120-7.2.3 Compaction Over Unstable Foundations:** Where the embankment material is deposited in water or on low swampy ground, and in a layer thicker than 12 inches (as provided in 120-6.2.2), compact the top 6 inches (compacted thickness) of such layer to the density as specified in 120-9.5.

**120-7.2.4 Compaction Where Plastic Material Has Been Removed:** Where unsuitable material is removed and the remaining surface is of the A-4, A-5, A-6, or A-7 Soil Groups, as determined by the Engineer, compact the surface of the excavated area by rolling with a sheepsfoot roller exerting a compression of at least 250 psi on the tamper feet, for the full width of the roadbed (subgrade and shoulders). Perform rolling before beginning any backfill, and continue until the roller feet do not penetrate the surface more than 1 inch. Do not perform such rolling where the remaining surface is below the normal water table and covered with water. Vary the procedure and equipment required for this operation at the discretion of the Engineer.

**120-7.2.5 Compaction of Material To Be Used In Base, Pavement, or Stabilized Areas:** Do not compact embankment material which will be incorporated into a pavement, base course, or stabilized subgrade, to be constructed as a part of the same Contract.

**120-7.2.6 Compaction of Grassed Shoulder Areas:** For the upper 6 inch layer of all shoulders which are to be grassed, since no specific density is required, compact only to the extent directed.

**120-7.2.7 Compaction of Grassed Embankment Areas:** For the outer layer of all embankments where plant growth will be established, do not compact. Leave this layer in a loose condition to a minimum depth of 6 inches for the subsequent seeding or planting operations.

**120-7.3 Compaction of Subgrade:** If the plans do not provide for stabilizing, compact the subgrade in both cuts and fills to the density specified in 120-9.5. For undisturbed soils, do not apply density requirements where constructing narrow widening strips or paved shoulders 5 feet or less in width.

Where trenches for widening strips are not of sufficient width to permit the use of standard compaction equipment, perform compaction using vibratory rollers, trench rollers, or other type compaction equipment approved by the Engineer.

Maintain the required density until the base or pavement is placed on the subgrade.

## **120-8 Backfilling Around Structures and Pipe.**

### **120-8.1 Requirements for all Structures:**

**120-8.1.1 General:** Backfill around structures and pipe in the dry whenever normal dewatering equipment and methods can accomplish the needed dewatering.

**120-8.1.2 Equipment and Methods:** Provide normal dewatering equipment including, but not limited to, surface pumps, sump pumps, wellpoints and header pipe and trenching/digging machinery. Provide normal dewatering methods including, but not limited to, constructing shallow surface drainage trenches/ditches, using sand blankets, perforated pipe drains, sumps and siphons.

**120-8.1.3 Backfill Materials:** Backfill to the original ground surface or subgrade surface of openings made for structures, with a sufficient allowance for settlement. The Engineer may require that the material used for this backfill be obtained from a source entirely apart from the structure.

Do not allow heavy construction equipment to cross over culvert or storm sewer pipes until placing and compacting backfill material to the finished earthwork grade or to an elevation at least 4 feet above the crown of the pipe.

**120-8.1.4 Use of A-7 Material:** In the backfilling of trenches, A-7 material may be used from a point 12 inches above the top of the pipe up to the elevation shown on the FDOT Design Standards as the elevation for undercutting of A-7 material.

**120-8.1.5 Time of Placing Backfill:** Do not place backfill against any masonry or concrete abutment, wingwall, or culvert until the Engineer has given permission to do so, and in no case until the masonry or concrete has been in place seven days or until the specified 28-day compressive strength occurs.

**120-8.1.6 Placement and Compaction:** When the backfill material is deposited in water, compact per 120-8.2.5 and 120-8.3.4. Place the material in horizontal layers not exceeding 6 inches compacted thickness, in depth above water level, behind abutments, wingwalls and end bents or end rest piers, and around box culverts and all structures including pipe culverts. The Engineer may approve placing material in thicker lifts of no more than 12 inches compacted thickness above the soil envelope if a test section demonstrates the required density can be achieved. Approval will be based on five passing density tests over the test section consisting of a lift of backfill from structure to structure. The Engineer will identify the test section with the compaction effort and soil classification in the Agency Logbook. In case of a change in compaction effort or soil classification, construct a new test section. The Engineer reserves the right to terminate the Contractor's use of thick lift construction and have him revert to the 6 inch compacted lifts whenever it is determined that satisfactory results are not being obtained.

### **120-8.2 Additional Requirements for Structures Other than Pipe:**

**120-8.2.1 Density:** Where the backfill material is deposited in water, obtain a 12 inch layer of comparatively dry material, thoroughly compacted by tamping, before the Engineer verifies layer and density requirements. Meet the requirements of the density Acceptance Criteria.

**120-8.2.2 Box Culverts:** For box culverts over which pavement is to be constructed, compact around the structure to an elevation not less than 12 inches above the top of the structure, using rapid-striking mechanical tampers.

**120-8.2.3 Other Limited Areas:** Compact in other limited areas using mechanical tampers or approved hand tampers, until the cover over the structure is at least 12 inches thick. When hand tampers are used, deposit the materials in layers not more than 4 inches thick using hand tampers suitable for this purpose with a face area of not more than 100 in<sup>2</sup>. Take special precautions to prevent any wedging action against the masonry, and step or terrace the slope bounding the excavation for abutments and wingwalls if required by the Engineer.

**120-8.2.4 Culverts and Piers:** Backfill around culverts and piers on both sides simultaneously to approximately the same elevation.

**120-8.2.5 Compaction Under Wet Conditions:** Where wet conditions do not permit the use of mechanical tampers, compact using hand tampers. Use only A-3 material for the hand tamped portions of the backfill. When the backfill has reached an elevation and condition such as to make the use of the mechanical tampers practical, perform mechanical tamping in such manner and to such extent as to transfer the compaction force into the sections previously tamped by hand.

**120-8.3 Additional Requirements for Pipe 15 Inches Inside Diameter or Greater:**

**120-8.3.1 General:** Trenches for pipe may have up to four zones that must be backfilled.

**Lowest Zone:** The lowest zone is backfilled for deep undercuts up to within 4 inches of the bottom of the pipe.

**Bedding Zone:** The zone above the Lowest Zone is the Bedding Zone. Usually it will be the backfill which is the 4 inches of soil below the bottom of the pipe. When rock or other hard material has been removed to place the pipe, the Bedding Zone will be the 12 inches of soil below the bottom of the pipe.

**Cover Zone:** The next zone is backfill that is placed after the pipe has been laid and will be called the Cover Zone. This zone extends to 12 inches above the top of the pipe. The Cover Zone and the Bedding Zone are considered the Soil Envelope for the pipe.

**Top Zone:** The Top Zone extends from 12 inches above the top of the pipe to the base or final grade.

**120-8.3.2 Material:**

**120-8.3.2.1 Lowest Zone:** Backfill areas undercut below the Bedding Zone of a pipe with coarse sand, or other suitable granular material, obtained from the grading operations on the project, or a commercial material if no suitable material is available.

**120-8.3.2.2 Soil Envelope:** In both the Bedding Zone and the Cover Zone of the pipe, backfill with materials classified as A-1, A-2, or A-3. Material classified as A-4 may be used if the pipe is concrete pipe.

**120-8.3.2.3 Top Zone:** Backfill the area of the trench above the soil envelope of the pipe with materials allowed on Design Standard, Index No. 505.

**120-8.3.3 Compaction:**

**120-8.3.3.1 Lowest Zone:** Compact the soil in the Lowest Zone to approximately match the density of the soil in which the trench was cut.

**120-8.3.3.2 Bedding Zone:** If the trench was not undercut below the bottom of the pipe, loosen the soil in the bottom of the trench immediately below the approximate middle third of the outside diameter of the pipe.

If the trench was undercut, place the bedding material and leave it in a loose condition below the middle third of the outside diameter of the pipe. Compact the outer portions to meet the density requirements of the Acceptance Criteria. Place the material in lifts no greater than 6 inches (compacted thickness).

**120-8.3.3.3 Cover Zone:** Place the material in 6 inches layers (compacted thickness), evenly deposited on both sides of the pipe, and compact with mechanical tampers suitable for this purpose. Hand tamp material below the pipe haunch that cannot be reached by mechanical tampers. Meet the requirements of the density Acceptance Criteria.

**120-8.3.3.4 Top Zone:** Place the material in layers not to exceed 12 inches in compacted thickness. Meet the requirements of the density Acceptance Criteria.

**120-8.3.4 Backfill Under Wet Conditions:** Where wet conditions are such that dewatering by normal pumping methods would not be effective, the procedure outlined below may be used when specifically authorized by the Engineer in writing.

Granular material may be used below the elevation at which mechanical tampers would be effective, but only material classified as A-3. Place and compact the material using timbers or hand tampers until the backfill reaches an elevation such that its moisture content will permit the use of mechanical tampers. When the backfill has reached such elevation, use normally acceptable backfill material. Compact the material using mechanical tampers in such manner and to such extent as to transfer the compacting force into the material previously tamped by hand.

## **120-9 Acceptance Program.**

**120-9.1 Density over 105%:** When a computed dry density results in a value greater than 105% of the applicable Proctor maximum dry density, the Engineer will perform a second density test within 5 feet. If the second density results in a value greater than 105%, investigate the compaction methods, examine the applicable Maximum Density and material description. If necessary, the Engineer will test an additional sample for acceptance in accordance with AASHTO T 99, Method C.

**120-9.2 Maximum Density Determination:** The Engineer will determine the maximum density and optimum moisture content by sampling and testing the material in accordance with the specified test method listed in 120-9.3.

**120-9.3 Density Testing Requirements:** Compliance with the requirements of 120-9.5 will be determined in accordance FM 1-T 238. The in-place moisture content will be determined for each density in accordance with FM 5-507 (Determination of Moisture Content by Means of a Calcium Carbide Gas Pressure Moisture Tester), or ASTM D 4643 (Laboratory Determination of Moisture Content of Granular Soils By Use of a Microwave Oven).

**120-9.4 Soil Classification:** The Engineer will perform soil classification tests in accordance with AASHTO T-88, and classify soils in accordance with AASHTO M-145 (Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes) in order to determine compliance with embankment utilization requirements.

**120-9.5 Acceptance Criteria:** The Engineer will accept a minimum density in accordance with 120-7.2 with the following exceptions:

- 1) embankment constructed by the hydraulic method as specified in 120-6.3;
- 2) material placed outside the standard minimum slope as specified in 120-6.2.4;
- 3) other areas specifically excluded herein.

**120-9.6 Frequency:** The Engineer will conduct sampling and testing at a minimum frequency listed in the table below.

Test Name	Frequency
Maximum Density	One per soil type
Density	1 per 500' RDWY (Alt Lift)
Soil Classification	One per Maximum Density

### **120-10 Maintenance and Protection of Work.**

While construction is in progress, maintain adequate drainage for the roadbed at all times. Maintain a shoulder at least 3 feet wide adjacent to all pavement or base construction in order to provide support for the edges.

Maintain and protect all earthwork construction throughout the life of the Contract, and take all reasonable precautions to prevent loss of material from the roadway due to the action of wind or water. Repair any slides, washouts, settlement, subsidence, or other mishap which may occur prior to final acceptance of the work. Maintain all channels excavated as a part of the Contract work against natural shoaling or other encroachments to the lines, grades, and cross-sections shown in the plans, until final acceptance of the project.

### **120-11 Construction.**

**120-11.1 Construction Tolerances:** Shape the surface of the earthwork to conform to the lines, grades, and cross-sections shown in the plans. In final shaping of the surface of earthwork, maintain a tolerance of 0.3 foot above or below the plan cross-section with the following exceptions:

1. Shape the surface of shoulders to within 0.1 foot of the plan cross-section.
2. Shape the earthwork to match adjacent pavement, curb, sidewalk, structures, etc.
3. Shape the bottom of ditches so that the ditch impounds no water.
4. When the work does not include construction of base or pavement, shape the entire roadbed (shoulder point to shoulder point) to within 0.1 foot above or below the plan cross-section.

Ensure that the shoulder lines do not vary horizontally more than 0.3 foot from the true lines shown in the plans.

**120-11.2 Operations Adjacent to Pavement:** Carefully dress areas adjacent to pavement areas to avoid damage to such pavement. Complete grassing of shoulder areas prior to placing the final wearing course. Do not manipulate any embankment material on a pavement surface.

When shoulder dressing is underway adjacent to a pavement lane being used to maintain traffic, exercise extreme care to avoid interference with the safe movement of traffic.

### **120-12 Method of Measurement.**

**120-12.1 Excavation:** Excavation will be paid for by volume, in cubic yards, calculated by the method of average end areas, unless the Engineer determines that another method of calculation will provide a more accurate result. The material will be measured in its original

position by field survey or by photogrammetric means as designated by the Engineer. Measurement for payment will include the excavation of unsuitable material, lateral ditch excavation, channel excavation, and excavation for structures and pipe. Payment will not be made for excavation or embankment beyond the limits shown in the plans or authorized by the Engineer.

**120-12.2 Embankment:** Measurement will be made on a loose volume basis, as measured in trucks or other hauling equipment at the point of dumping on the road. Payment will not be made for embankment beyond the limits shown in the plans or authorized by the Engineer.

### **120-13 Basis of Payment.**

**120-13.1 General:** Prices and payments for the work items included in this Section will be full compensation for all work described herein, including excavating, dredging, hauling, placing, and compacting; dressing the surface of the earthwork; and maintaining and protecting the complete earthwork.

**120-13.2 Excavation:** The total quantity of all excavation specified under this Section will be paid for at the Contract unit price for Excavation. No payment will be made for the excavation of any materials which are used for purposes other than those shown in the plans or designated by the Engineer. No payment will be made for materials excavated outside the lines and grades given by the Engineer, unless specifically authorized by the Engineer.

**120-13.3 Embankment:** The total quantity of embankment specified in this Section will be paid for at the Contract unit price for embankment. No payment will be made for materials which are used for purposes other than those shown in the plans or designated by the Engineer. No payment will be made for materials placed outside the lines and grades given by the Engineer.

**SUPERPAVE ASPHALT FOR LAP (OFF-SYSTEM).**  
**(REV 1-26-15) (FA 1-29-15)**

**SECTION 334**  
**SUPERPAVE ASPHALT FOR LAP (OFF-SYSTEM)**

**334-1 Description.**

**334-1.1 General:** Construct a Superpave asphalt pavement (consisting of either Hot Mix Asphalt (HMA) or Warm Mix Asphalt (WMA)) based on the type of work specified in the Contract and the Asphalt Work Categories as defined below. Meet the applicable requirements for plants, equipment, and construction requirements as defined below. Use an asphalt mix, either HMA or WMA, which meets the requirements of this specification.

**334-1.2 Asphalt Work Mix Categories:** Construction of asphalt pavement will fall into one of the following work categories:

**334-1.2.1 Asphalt Work Category 1:** Includes the construction of shared use paths and miscellaneous asphalt.

**334-1.2.2 Asphalt Work Category 2:** Includes the construction of new asphalt turn lanes, paved shoulders and other non-mainline pavement locations.

**334-1.2.3 Asphalt Work Category 3:** Includes the construction of new mainline asphalt pavement lanes, milling and resurfacing.

**334-1.3 Mix Types:** Use the appropriate asphalt mix as shown in Table 334-1.

Table 334-1 Asphalt Mix Types			
Asphalt Work Category	Mix Types	Traffic Level	ESALs (millions)
1	Type SP-9.5	A	<0.3
2	Structural Mixes: Types SP-9.5 or SP-12.5 Friction Mixes: Types FC-9.5 or FC-12.5	B	0.3 to <3
3	Structural Mixes: Types SP-9.5 or SP-12.5 Friction Mixes: Types FC-9.5 or FC-12.5	C	≥3

A Type SP or FC mix one traffic level higher than the traffic level specified in the Contract may be substituted, at no additional cost (i.e. Traffic Level B may be substituted for Traffic Level A, etc.). Traffic levels are as defined in Section 334 of the Florida Department of Transportation's (FDOT's) Specifications.

**334-1.4 Gradation Classification:** The Superpave mixes are classified as fine and are defined in 334-3.2.2. The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

Type SP-9.5, FC-9.5 ..... 9.5 mm

Type SP-12.5, FC-12.5 ..... 12.5 mm

**334-1.5 Thickness:** The total pavement thickness of the asphalt pavement will be based on a specified spread rate or plan thickness as shown in the Contract Documents. Before paving, propose a spread rate or thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan spread rate or thickness. When the total pavement thickness is specified as plan thickness, the plan thickness and individual layer thickness will be converted to spread rate using the following equation:

$$\text{Spread rate (lbs/yd}^2\text{)} = t \times G_{\text{mm}} \times 43.3$$

where: t = Thickness (in.) (Plan thickness or individual layer thickness)  
G<sub>mm</sub> = Maximum specific gravity from the mix design

For target purposes only, spread rate calculations shall be rounded to the nearest whole number.

**334-1.5.1 Layer Thicknesses:** Unless otherwise called for in the Contract Documents, the allowable layer thicknesses for asphalt mixtures are as follows:

Type SP-9.5, FC-9.5 ..... 3/4 to 1-1/2 inches  
Type SP-12.5, FC-12.5 ..... 1-1/2 to 2-1/2 inches

**334-1.5.2 Additional Requirements:** The following requirements also apply to asphalt mixtures:

1. When construction includes the paving of adjacent shoulders (less than or equal to 5 feet wide), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless otherwise called for in the Contract Documents.
2. For overbuild layers, use the minimum and maximum layer thicknesses as specified above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness will be as specified below, unless called for differently in the Contract Documents.

Type SP-9.5..... 3/8 to 2 inches  
Type SP-12.5..... 1/2 to 3 inches

3. Variable thickness overbuild layers may be tapered to zero thickness provided the contract documents require a minimum of 1-1/2 inches of mix placed over the variable thickness overbuild layer.

**334-1.6 Weight of Mixture:** The weight of the mixture shall be determined as provided in 320-3.2 of the FDOT Specifications.

**334-2 Materials.**

**334-2.1 Superpave Asphalt Binder:** Unless specified elsewhere in the Contract or in 334-2.3.3, use a PG 67-22 asphalt binder from the FDOT’s Approved Products List (APL). If the Contract calls for an alternative asphalt binder, meet the requirements of FDOT Specifications Section 336 or 916, as appropriate.

**334-2.2 Aggregate:** Use aggregate capable of producing a quality pavement.

For Type FC mixes, use an aggregate blend that consists of crushed granite, crushed Oolitic limestone, other crushed materials (as approved by FDOT for friction courses per Rule 14-103.005, Florida Administrative Code), or a combination of the above. Crushed

limestone from the Oolitic formation may be used if it contains a minimum of 12% silica material as determined by FDOT Test Method FM 5-510 and FDOT grants approval of the source prior to its use. As an exception, mixes that contain a minimum of 60% crushed granite may either contain:

1. Up to 40% fine aggregate from other sources; or,
2. A combination of up to 20% RAP and the remaining fine aggregate

from other sources.

A list of aggregates approved for use in friction courses may be available on the FDOT's State Materials Office website. The URL for obtaining this information, if available, is: <ftp://ftp.dot.state.fl.us/fdot/smo/website/sources/frictioncourse.pdf>.

**334-2.3 Reclaimed Asphalt Pavement (RAP) Material:**

**334-2.3.1 General requirements:** RAP may be used as a component of the asphalt mixture, provided the RAP meets the following requirements:

1. When using a PG 76-22 (PMA), or PG 76-22 (ARB) asphalt binder, limit the amount of RAP material used in the mix to a maximum of 20% by weight of total aggregate. As an exception, amounts greater than 20% RAP by weight of total aggregate can be used if no more than 20% by weight of total asphalt binder comes from the RAP material.
2. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.
3. Provide RAP material having a minimum average asphalt binder content of 4.0% by weight of RAP. As an exception, when using fractionated RAP, the minimum average asphalt binder content for the coarse portion of the RAP shall be 2.5% by weight of the coarse portion of the RAP. The coarse portion of the RAP shall be the portion of the RAP retained on the No. 4 sieve. The Engineer may sample the stockpile to verify that this requirement is met.
4. Use a grizzly or grid over the RAP cold bin, in-line roller crusher, screen, or other suitable means to prevent oversized RAP material from showing up in the completed recycle mixture. If oversized RAP material appears in the completed recycle mix, take the appropriate corrective action immediately. If the appropriate corrective actions are not immediately taken, stop plant operations.

**334-2.3.2 Material Characterization:** Assume responsibility for establishing the asphalt binder content, gradation, and bulk specific gravity ( $G_{sb}$ ) of the RAP material based on a representative sampling of the material.

**334-2.3.3 Asphalt Binder for Mixes with RAP:** Select the appropriate asphalt binder grade based on Table 334-2. The Engineer reserves the right to change the asphalt binder type and grade during production based on characteristics of the RAP asphalt binder.

Table 334-2 Asphalt Binder Grade for Mixes Containing RAP	
Percent RAP	Asphalt Binder Grade
0 - 15	PG 67-22
16 - 30	PG 58-22
> 30	PG 52-28

### 334-3 Composition of Mixture.

**334-3.1 General:** Compose the asphalt mixture using a combination of aggregates, mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

#### 334-3.2 Mix Design:

**334-3.2.1 General:** Design the asphalt mixture in accordance with AASHTO R 35-12, except as noted herein. Submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. Prior to the production of any asphalt mixture, obtain the Engineer's conditional approval of the mix design. If required by the Engineer, send representative samples of all component materials, including asphalt binder to a laboratory designated by the Engineer for verification. As an exception to these requirements, use a currently approved FDOT Mix Design.

Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, is:

<http://www.dot.state.fl.us/statematerialsoffice/quality/programs/warmmixasphalt/index.shtm>.

The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and at his discretion, the Engineer may no longer allow the use of the mix design.

**334-3.2.2 Mixture Gradation Requirements:** Combine the aggregates in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M 323-12, Table 3. Aggregates from various sources may be combined.

**334-3.2.2.1 Mixture Gradation Classification:** Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M323-12, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M323-12, Table 4. Fine mixes are defined as having a gradation that passes above or through the primary control sieve control point.

**334-3.2.3 Gyrotory Compaction:** Compact the design mixture in accordance with AASHTO T312-12, with the following exceptions: use the number of gyrations at  $N_{\text{design}}$  as designed in Table 334-3.

Traffic Level	$N_{\text{design}}$ Number of Gyrations
A	50
B	65
C	75

**334-3.2.4 Design Criteria:** Meet the requirements for nominal maximum aggregate size as defined in AASHTO M323-12, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M323-12, Table 6.  $N_{\text{initial}}$  and  $N_{\text{maximum}}$  requirements are not applicable.

**334-3.2.5 Moisture Susceptibility:** Test 4 inch specimens in accordance with FDOT Test Method FM 1-T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 pounds per square inch. If necessary, add a liquid anti-stripping agent from the FDOT's APL or hydrated lime in order to meet these criteria.

In lieu of moisture susceptibility testing, add a liquid anti-stripping agent from the FDOT's APL. Add 0.5% liquid anti-stripping agent by weight of asphalt binder.

**334-3.2.6 Additional Information:** In addition to the requirements listed above, provide the following information on each mix design:

1. The design traffic level and the design number of gyrations ( $N_{\text{design}}$ ).
2. The source and description of the materials to be used.
3. The FDOT source number and the FDOT product code of the aggregate components furnished from an FDOT approved source (if required).
4. The gradation and proportions of the raw materials as intended to be combined in the paving mixture. The gradation of the component materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.
5. A single percentage of the combined mineral aggregate passing each specified sieve. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.
6. The bulk specific gravity ( $G_{\text{sb}}$ ) value for each individual aggregate and RAP component.
7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.
8. A target temperature for the mixture at the plant (mixing temperature) and a target temperature for the mixture at the roadway (compaction temperature). Do not exceed a target temperature of 330°F for PG 76-22 (PMA) and PG 76-22 (ARB) asphalt binders, and 315°F for unmodified asphalt binders.
9. Provide the physical properties achieved at four different asphalt binder contents. One shall be at the optimum asphalt content, and must conform to all specified physical requirements.
10. The name of the mix designer.
11. The ignition oven calibration factor.
12. The warm mix technology, if used.

#### **334-4 Process Control.**

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and roadway to control the process.

#### **334-5 General Construction Requirements.**

**334-5.1 Weather Limitations:** Do not transport asphalt mix from the plant to the roadway unless all weather conditions are suitable for the paving operations.

##### **334-5.2 Limitations of Paving Operations:**

**334-5.2.1 General:** Spread the mixture only when the surface upon which it is to be placed has been previously prepared, is intact, firm, dry, clean, and the tack, with acceptable

spread rate, is properly broken. Ensure all granular base materials are properly primed and all asphalt base materials are properly tacked, prior to paving.

<b>334-5.2.2 Air Temperature:</b> Place the mixture only when the air temperature in the shade and away from the artificial heat meets the requirements of Table 334-4. The minimum ambient temperature requirement may be reduced by 5°F when using a warm mix technology, if mutually agreed to by both the Engineer and the Contractor. Table 334-4 Ambient Air Temperature Requirements for Paving	
Layer Thickness or Asphalt Binder Type	Minimum Temperature (°F)
≤1 inch	50
Any mixture > 1 inch containing a PG asphalt binder with a high temperature designation ≥ 76°C	45
Any mixture > 1 inch containing a PG asphalt binder with a high temperature designation < 76°C	40

**334-5.3 Mix Temperature:** Heat and combine the ingredients of the mix in such a manner as to produce a mixture with a temperature at the plant and at the roadway, within a range of plus or minus 30°F from the target temperature as shown on the mix design. Reject all loads outside of this range. For warm mix asphalt, the Contractor may produce the first five loads of the production day and at other times when approved by the Engineer, at a hot mix asphalt temperature not to exceed 330°F for purposes of heating the asphalt paver. For these situations, the upper tolerance of +30°F does not apply.

**334-5.4 Transportation of the Mixture:** Transport the mix in trucks of tight construction, which prevents the loss of material and the excessive loss of heat and previously cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck body. Do not use a release agent that will contaminate, degrade, or alter the characteristics of the asphalt mix or is hazardous or detrimental to the environment. Petroleum derivatives (such as diesel fuel), solvents, and any product that dissolves asphalt are prohibited. Provide each truck with a tarpaulin or other waterproof cover mounted in such a manner that it can cover the entire load when required. When in place, overlap the waterproof cover on all sides so it can be tied down. Cover each load during cool and cloudy weather and at any time it appears rain is likely during transit with a tarpaulin or waterproof cover. Cover and tie down all loads of friction course mixtures.

**334-5.5 Preparation of Surfaces Prior to Paving:**

**334-5.5.1 Cleaning:** Clean the surface of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary.

**334-5.5.2 Patching and Leveling Courses:** As shown in the plans, bring the existing surface to proper grade and cross-section by the application of patching or leveling courses.

**334-5.5.3 Application over Surface Treatment:** Where an asphalt mix is to be placed over a surface treatment, sweep and dispose of all loose material from the paving area.

**334-5.5.4 Tack Coat:** Use a rate of application as defined in Table 334-5. Control the rate of application to be within plus or minus 0.01 gallon per square yard of the target application rate. The target application rate may be adjusted by the Engineer to meet specific field conditions. Determine the rate of application as needed to control the operation. When using PG 52-28, multiply the target rate of application by 0.6.

Table 334-5 Tack Coat Application Rates		
Asphalt Mixture Type	Underlying Pavement Surface	Target Tack Rate (gal/yd <sup>2</sup> )
Base Course, Structural Course, Dense Graded Friction Course	Newly Constructed Asphalt Layers	0.03 minimum
	Milled Surface or Oxidized and Cracked Pavement	0.06
	Concrete Pavement	0.08

### 334-5.6 Placing Mixture:

**334-5.6.1 Alignment of Edges:** With the exception of pavements placed adjacent to curb and gutter or other true edges, place all pavements by the stringline method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than plus or minus 1.5 inches from the stringline.

**334-5.6.2 Rain and Surface Conditions:** Immediately cease transportation of asphalt mixtures from the plant when rain begins at the roadway. Do not place asphalt mixtures while rain is falling, or when there is water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer and the temperature of the mixture caught in transit still meets the requirements as specified in 334-5.3, the Contractor may then place the mixture caught in transit.

**334-5.6.3 Checking Depth of Layer:** Check the depth of each layer at frequent intervals to ensure a uniform spread rate that will meet the requirements of the Contract.

**334-5.6.4 Hand Work:** In limited areas where the use of the spreader is impossible or impracticable, spread and finish the mixture by hand.

**334-5.6.5 Spreading and Finishing:** Upon arrival, dump the mixture in the approved paver, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, is secured. Carry a uniform amount of mixture ahead of the screed at all times.

**334-5.6.6 Thickness Control:** Ensure the spread rate is within 10% of the target spread rate, as indicated in the Contract. When calculating the spread rate, use, at a minimum, an average of five truckloads of mix. When the average spread rate is beyond plus or minus 10% of the target spread rate, monitor the thickness of the pavement layer closely and adjust the construction operations.

If the Contractor fails to maintain an average spread rate within plus or minus 10% of the target spread rate for two consecutive days, the Engineer may elect to stop the construction operation at any time until the issue is resolved.

When the average spread rate for the total structural or friction course pavement thickness exceeds the target spread rate by plus or minus 50 pounds per square yard for layers greater than or equal to 2.5 inches or exceeds the target spread rate by plus or minus 25 pounds per square yard for layers less than 2.5 inches, address the unacceptable pavement in accordance with 334-5.10.4, unless an alternative approach is agreed upon by the Engineer.

### **334-5.7 Leveling Courses:**

**334-5.7.1 Patching Depressions:** Before spreading any leveling course, fill all depressions in the existing surface as shown in the plans.

**334-5.7.2 Spreading Leveling Courses:** Place all courses of leveling with an asphalt paver or by the use of two motor graders, one being equipped with a spreader box. Other types of leveling devices may be used upon approval by the Engineer.

**334-5.7.3 Rate of Application:** When using Type SP-9.5 for leveling, do not allow the average spread of a layer to be less than 50 pounds per square yard or more than 75 pounds per square yard. The quantity of mix for leveling shown in the plans represents the average for the entire project; however, the Contractor may vary the rate of application throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require placing all the leveling mix prior to the widening operation.

**334-5.8 Compaction:** For each paving or leveling train in operation, furnish a separate set of rollers, with their operators.

When density testing for acceptance is required, select equipment, sequence, and coverage of rolling to meet the specified density requirement. Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

When density testing for acceptance is not required, use a rolling pattern approved by the Engineer.

Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.

### **334-5.9 Joints.**

**334-5.9.1 Transverse Joints:** Construct smooth transverse joints, which are within 3/16 inch of a true longitudinal profile when measured with a 15 foot manual straightedge meeting the requirements of FDOT Test Method FM 5-509. These requirements are waived for transverse joints at the beginning and end of the project and at the beginning and end of bridge structures, if the deficiencies are caused by factors beyond the control of the Contractor such as no milling requirement, as determined by the Engineer. When smoothness requirements are waived, construct a reasonably smooth transitional joint.

**334-5.9.2 Longitudinal Joints:** For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. Do not construct longitudinal joints in the wheel paths. The Engineer may waive these requirements where offsetting is not feasible due to the sequence of construction.

**334-5.10 Surface Requirements:** Construct a smooth pavement with good surface texture and the proper cross slope.

**334-5.10.1 Texture of the Finished Surface of Paving Layers:** Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Correct any area of the surface that does not meet the foregoing requirements in accordance with 334-5.10.4.

In areas not defined to be a density testing exception per 334-6.4.1, obtain for the Engineer, three 6 inch diameter roadway cores at locations visually identified by the Engineer to be segregated. The Engineer will determine the density of each core in accordance with FDOT

Test Method FM 1-T 166 and calculate the percent  $G_{mm}$  of the segregated area using the average  $G_{mb}$  of the roadway cores and the representative PC  $G_{mm}$  for the questionable material. If the average percent  $G_{mm}$  is less than 90.0, address the segregated area in accordance with 334-5.10.4.

**334-5.10.2 Cross Slope:** Construct a pavement surface with cross slopes in compliance with the requirements of the Contract Documents.

**334-5.10.3 Pavement Smoothness:** Construct a smooth pavement meeting the requirements of this Specification. Furnish a 15 foot manual and a 15 foot rolling straightedge meeting the requirements of FDOT Test Method FM 5-509.

**334-5.10.3.1 Straightedge Testing:**

**334-5.10.3.1.1 Acceptance Testing:** Perform straightedge testing in the outside wheel path of each lane for the final (top) layer of the pavement. Test all pavement lanes where the width is constant using a rolling straightedge and document all deficiencies on a form approved by the Engineer. Notify the Engineer of the location and time of all straightedge testing a minimum of 48 hours before beginning testing.

**334-5.10.3.1.2 Final (Top) Pavement Layer:** At the completion of all paving operations, straightedge the final (top) layer either behind the final roller of the paving train or as a separate operation. Address all deficiencies in excess of 3/16 inch in accordance with 334-5.10.4, unless waived by the Engineer. Retest all corrected areas.

**334-5.10.3.1.3 Straightedge Exceptions:** Straightedge testing will not be required in the following areas: shoulders, intersections, tapers, crossovers, sidewalks, shared use paths, parking lots and similar areas, or in the following areas when they are less than 250 feet in length: turn lanes, acceleration/deceleration lanes and side streets. The limits of the intersection will be from stop bar to stop bar for both the mainline and side streets. In the event the Engineer identifies a surface irregularity in the above areas that is determined to be objectionable, straightedge and address all deficiencies in excess of 3/8 inch in accordance with 334-5.10.4.

**334-5.10.4 Correcting Unacceptable Pavement:** Correct deficiencies in the pavement layer by removing and replacing the full depth of the layer, extending a minimum of 50 feet on both sides (where possible) of the defective area for the full width of the paving lane, at no additional cost.

**334-6 Acceptance of the Mixture.**

**334-6.1 General:** The asphalt mixture will be accepted based on the Asphalt Work Category as defined below:

1. Asphalt Work Category 1 – Certification by the Contractor as defined in 334-6.2.

2. Asphalt Work Category 2 – Certification and process control testing by the Contractor as defined in 334-6.3.

3. Asphalt Work Category 3 – Process control testing by the Contractor and acceptance testing by the Engineer as defined in 334-6.4.

**334-6.2 Certification by the Contractor:** On Asphalt Work Category 1 construction, the Engineer will accept the mix on the basis of visual inspection. Submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project meets the requirements of the Specifications. The Engineer may run independent tests to determine the acceptability of the material.

**334-6.3 Certification and Process Control Testing by the Contractor:** On Asphalt Work Category 2 construction, submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project meets the requirements of the Specifications, along with supporting test data documenting all process control testing as described in 334-6.3.1. If required by the Contract, utilize an Independent Laboratory as approved by the Engineer for the process control testing. The mix will also require visual acceptance by the Engineer. In addition, the Engineer may run independent tests to determine the acceptability of the material. Material failing to meet these acceptance criteria will be addressed as directed by the Engineer such as but not limited to acceptance at reduced pay, delineation testing to determine the limits of the questionable material, removal and replacement at no cost to the agency, or performing an Engineering analysis to determine the final disposition of the material.

**334-6.3.1 Process Control Sampling and Testing Requirements:** Perform process control testing at a frequency of once per day. Obtain the samples in accordance with FDOT Method FM 1-T 168. Test the mixture at the plant for gradation (P<sub>8</sub> and P<sub>200</sub>) and asphalt binder content (P<sub>b</sub>). Measure the roadway density with 6 inch diameter roadway cores at a minimum frequency of once per 1,500 feet of pavement with a minimum of three cores per day.

Determine the asphalt binder content of the mixture in accordance with FDOT Method FM 5-563. Determine the gradation of the recovered aggregate in accordance with FDOT Method FM 1-T 030. Determine the roadway density in accordance with FDOT Method FM 1-T 166. The minimum roadway density will be based on the percent of the maximum specific gravity (G<sub>mm</sub>) from the approved mix design. If the Contractor or Engineer suspects that the mix design G<sub>mm</sub> is no longer representative of the asphalt mixture being produced, then a new G<sub>mm</sub> value will be determined from plant-produced mix, in accordance with FDOT Method FM 1-T 209, with the approval of the Engineer. Roadway density testing will not be required in certain situations as described in 334-6.4.1. Assure that the asphalt binder content, gradation and density test results meet the criteria in Table 334-4.

Characteristic	Tolerance
Asphalt Binder Content (percent)	Target ± 0.55
Passing No. 8 Sieve (percent)	Target ± 6.00
Passing No. 200 Sieve (percent)	Target ± 2.00
Roadway Density (daily average)	Minimum 90.0% of G <sub>mm</sub>

**334-6.4 Process Control Testing by the Contractor and Acceptance Testing by the Engineer:** On Asphalt Work Category 3, perform process control testing as described in 334-6.3.1. In addition, the Engineer will accept the mixture at the plant with respect to gradation (P<sub>8</sub> and P<sub>200</sub>) and asphalt binder content (P<sub>b</sub>). The mixture will be accepted on the roadway with respect to density. The Engineer will sample and test the material as described in 334-6.3.1. The Engineer will randomly obtain at least one set of samples per day. Assure that the asphalt content, gradation and density test results meet the criteria in Table 334-4. Material failing to meet these acceptance criteria will be addressed as directed by the Engineer such as but not limited to acceptance at reduced pay, delineation testing to determine the limits of the

questionable material, removal and replacement at no cost to the agency, or performing an Engineering analysis to determine the final disposition of the material.

**334-6.4.1 Acceptance Testing Exceptions:** When the total quantity of any mix type in the project is less than 500 tons, the Engineer will accept the mix on the basis of visual inspection. The Engineer may run independent tests to determine the acceptability of the material.

Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, variable thickness overbuild courses, leveling courses, any asphalt layer placed on subgrade (regardless of type), miscellaneous asphalt pavement, shared use paths, crossovers, or any course with a specified thickness less than 1 inch or a specified spread rate less than 100 pounds per square yard. Density testing for acceptance will not be performed on asphalt courses placed on bridge decks or approach slabs; compact these courses in static mode only. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet continuous in length: turning lanes, acceleration lanes, deceleration lanes, shoulders, parallel parking lanes, or ramps. Density testing for acceptance will not be performed in intersections. The limits of the intersection will be from stop bar to stop bar for both the mainline and side streets. Compact these courses in accordance with a standard rolling procedure approved by the Engineer. In the event that the rolling procedure deviates from the approved procedure, placement of the mix will be stopped.

#### **334-7 Method of Measurement.**

For the work specified under this Section, the quantity to be paid for will be the weight of the mixture, in tons.

The bid price for the asphalt mix will include the cost of the liquid asphalt and the tack coat application as specified in 334-5.5.4. There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix.

#### **334-8 Basis of Payment.**

**334-8.1 General:** Price and payment will be full compensation for all the work specified under this Section.

**CONCRETE FOR LAP (OFF-SYSTEM).**  
**(REV 12-20-11) (FA 2-27-12)**

**SECTION 344**  
**CONCRETE FOR LAP (OFF-SYSTEM)**

**344-1 Description.**

**344-1 General:** Construct concrete based on the type of work as described in the Contract and the concrete work categories as defined below.

**344-1.2 Work Categories:** Construction will fall into one of the following concrete work categories:

**344-1.2.1 Concrete Work Category 1:** Includes the construction of sidewalks, curb and gutter, ditch and slope pavement, or other non-reinforced cast-in-place elements.

**344-1.2.2 Concrete Work Category 2:** Includes the construction of precast concrete including concrete barriers, traffic railing barriers, parapets, sound barriers, inlets, manholes, junction boxes, pipe culverts, storm sewers, box culverts, prestressed concrete poles, concrete bases for light poles, highway sign foundations, retaining wall systems, traffic separators or other structural precast elements.

**344-1.2.3 Concrete Work Category 3:** Includes the work associated with the placement and/or construction of structural cast-in-place concrete meeting the requirements of this section.

**344-2 Materials.**

**344-2.1 General:** Use concrete composed of a mixture of Portland cement, aggregates, and water, with or without chemical or mineral admixtures that meet the following requirements:

**344-2.1.1 Portland Cement:** Portland cements meeting the requirements of AASHTO M-85 or ASTM C-150 is required. Different brands of cement, cement of the same brand from different facilities or different types of cement shall be stored separately and shall not be mixed.

**344-2.1.2 Coarse and Fine Aggregates:** Aggregates shall meet ASTM C 33. Source approval by the FDOT is not required.

**344-2.1.3 Water:** Water shall meet the requirements of ASTM C 1602.

**344-2.1.4 Chemical Admixtures:** Chemical admixtures shall be listed on the FDOT Qualified Products List. Admixtures may be added at the dosage rates recommended by the manufacturer.

**344-2.1.5 Pozzolans and Slag:** Pozzolans and Slag shall meet the requirements of Table 344-1. Fly ash shall not include the residue resulting from the burning of municipal garbage or any other refuse with coal, or the burning of industrial or municipal garbage in incinerators.

Type or Class	Test Method	Exceptions
Class C Fly Ash	ASTM C 618	Not to be used with Types IP or IS cements.
Class F Fly Ash	ASTM C 618	Not to be used with Types IP or IS cements.
Petroleum Coke Class F	ASTM C 618	Not to be used with Types IP or IS cements.

Bark Ash Class F	ASTM C 618	Not to be used with Types IP or IS cements.
Silica Fume	ASTM C 1240	
Metakaolin	ASTM C 618	
Slag	ASTM C 989	Use only ground granulated blast-furnace slag grade 100 or 120.
Ultra Fine Fly Ash	ASTM C 618	Not to be used with Types IP or IS cements.

### 344-3 Production, Mixing and Delivery of Concrete.

#### 344-3.1 Concrete Production Requirements:

**344-3.1.1 Category 1:** Use a concrete production facility that is certified by the National Ready Mixed Concrete Association (NRMCA) or listed on the FDOT list of non-structural concrete producers. Concrete production facilities listed on the FDOT Producers with Accepted QC Programs list for structural concrete may also be used for Category 1.

**344-3.1.2 Category 2:** Use a prestressed and or precast facility listed on the FDOT Producers with Accepted QC Programs for precast or prestressed concrete.

**344-3.1.3 Category 3:** Use a structural concrete facility listed on the FDOT Producers with Accepted QC Programs for structural concrete.

#### 344-3.2 Classes of Concrete: Meet the requirements of Table 344-2.

Table 344-2						
Class	Minimum Strength (28 day) (psi)	Target Slump (inches)	Target Range (inches)	Air Content Range (%)	Minimum Total Cementitious Materials Content (lb/yd <sup>3</sup> )	Maximum Water to Cementitious Material Ratio (lb/lb)
Category 1						
Class NS	2,500	N/A	N/A	N/A	N/A	N/A
Category 3						
I	3,000	3	± 1.5	1.0 to 6.0	470	0.53
I (Pavement)	3,000	2	± 1.5	1.0 to 6.0	470	0.50
II	3,400	3	± 1.5	1.0 to 6.0	470	0.53
II (Bridge Deck)	4,500	3	± 1.5	1.0 to 6.0	611	0.44
III	5,000	3	± 1.5	1.0 to 6.0	611	0.44
III (Seal)	3,000	8	± 1.5	1.0 to 6.0	611	0.53
IV	5,500	3	± 1.5	1.0 to 6.0	658	0.41
IV (Drilled Shaft)	4,000	8.5	± 1.5	0.0 to 6.0	658	0.41
V (Special)	6,000	3	± 1.5	1.0 to 6.0	752	0.37
V	6,500	3	± 1.5	1.0 to 6.0	752	0.37
VI	8,500	3	± 1.5	1.0 to 6.0	752	0.37

**344-3.3 Contractors Quality Control:** For Categories 1 and 2, assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times.

For Category 3, furnish a Quality Control (QC) plan to identify to the Engineer how quality will be ensured at the project site. During random inspections, the Engineer will use this document to verify that the construction of the project is in agreement with the QC plan.

**344-3.4 Concrete Mix Design:** Before producing any Category 1 or Category 2, submit the proposed mix designs to the Engineer on a form provided by the Engineer. For Category 3, submit to the Engineer for approval, FDOT approved mix designs. Do not use concrete mix designs without prior approval of the Engineer.

Materials may be adjusted provided that the theoretical yield requirement of the approved mix design is met. Show all required original approved design mix data and batch adjustments on an Engineer approved concrete delivery ticket.

**344-3.5 Delivery:** For Category 3, the maximum allowable transit time of concrete is 90 minutes.

Furnish a delivery ticket on a form approved by the Engineer with each batch of concrete before unloading at the placement site. Record material quantities incorporated into the mix on the delivery ticket. Ensure that the Batchers responsible for producing the concrete signs the delivery ticket certifying that the batch was produced and delivered in accordance with these requirements. Sign the delivery ticket certifying that the concrete was placed in accordance with these requirements.

**344-3.6 Placing Concrete:**

**344-3.6.1 Concreting in Cold Weather:** Do not mix or place concrete when the air temperature at placement is below 45°F.

During the curing period, if NOAA predicts the ambient temperature to fall below 35°F for 12 hours or more or to fall below 30°F for more than 4 hours, enclose the structure in such a way that the air temperature within the enclosure can be kept above 50°F for a period of 3 days after placing the concrete or until the concrete reaches a minimum compressive strength of 1,500 psi.

Assume all risks connected with the placing and curing of concrete. Although the Engineer may give permission to place concrete, the Contractor is responsible for satisfactory results. If the placed concrete is determined to be unsatisfactory, remove, dispose of, and replace the concrete at no expense to the Agency.

**344-3.6.2 Concreting in Hot Weather:** For Category 3, hot weather concreting is defined as the production, placing and curing of concrete when the concrete temperature at placing exceeds 86°F but is less than 100°F.

Unless the specified hot weather concreting measures are in effect, reject concrete exceeding 86°F at the time of placement. Regardless of special measures taken, reject concrete exceeding 100°F. Predict the concrete temperatures at placement time and implement hot weather measures to avoid production shutdown.

**344-3.7 Mixers:** For Category 3 concrete, do not place concrete from a truck mixer that does not have a current FDOT mixer identification card.

**344-3.8 Small Quantities of Concrete:** With approval of the Engineer, small quantities of concrete, less than 3 cubic yards placed in one day and less than 0.5 cubic yards placed in a single placement may be accepted using a pre-bagged mixture. The Engineer may verify that the pre-bagged mixture is prepared in accordance with the manufacturer's recommendations and will meet the requirements of this Specification.

**344-3.9 Sampling and Testing:**

**344-3.9.1 Category 1:** The Engineer may sample and test the concrete to verify its quality. The minimum 28 day compressive strength requirement for this concrete is 2,500 psi.

**344-3.9.2: Category 2:** No sampling and testing is required for category 2.

**344-3.9.3 Category 3:** The Engineer will randomly select a sample from each 200 cubic yards or one day's production to determine plastic properties and to make three 4 x 8 inch cylinders for testing by the Engineer at 28 days to ensure that the design compressive strength has been met for the class of concrete as specified in Table 344-2.

**344-3.10 Records:** Ensure the following records are available for review for at least 3 years after final acceptance of the project:

1. Approved concrete mix designs.
2. Materials source (delivery tickets, certifications, certified mill test reports).
3. A copy of the scale company or testing agency report showing the observed deviations from quantities checked during calibration of the scales and meters.
4. A copy of the documentation certifying the admixture weighing/measuring devices.

#### **344-4 Acceptance of the Work.**

**344-4.1 Category 1 Work:** Category 1 work will be accepted based on certification by the batcher and contractor on the delivery ticket.

**344-4.2 Category 2 Work:** Certify that the precast elements were produced by a production facility on the FDOT's list of Producers with Accepted QC Programs for precast or prestressed concrete. In addition, the producer's logo shall be stamped on the element. The producer shall not use the Florida Department of Transportation QC stamp on elements used on this project. Provide a statement of certification from the manufacturer of the precast element that the element meets the requirements of this Specification.

**344-4.3 Category 3 Work:** Category 3 concrete will be accepted based on the Engineer's test results for plastic properties and compressive strength requirements for the class of concrete as defined in Table 344-2. In addition, a Delivery Ticket as described in 344-3.5 will be required for acceptance of the material at the project site.

**344-4.4 Small Quantities of Concrete:** Category 3 concrete meeting the definition of 344-3.8 will be accepted in accordance with 344-4.3 based on test results for plastic properties and compressive strength.

#### **344-5 Method of Measurement.**

The quantities to be paid for will be the items shown in the plans, completed and accepted.

#### **344-6 Basis of Payment.**

Prices and payments will be full compensation for all work and materials specified in this Section.

**LANDSCAPE INSTALLATION FOR LAP (OFF-SYSTEM).**  
**(REV 4-5-11) (FA 4-15-11)**

**SECTION 580**  
**LANDSCAPE INSTALLATION FOR LAP (OFF-SYSTEM)**

**580-1 Description.**

Plant trees and shrubs of the species, size, and quality indicated in the plans.

The Engineer reserves the right to adjust the number and location of any of the designated types and species to be used at any of the locations shown, in order to provide for any unanticipated effects which might become apparent after the substantial completion of other phases of the project, or for other causes.

**580-2 Materials.**

**580-2.1 Plants:**

**580-2.1.1 Authority for Nomenclature; Species, etc.:** For the designated authority in the identification of all plant material, refer to two publications of L.H. Bailey: "Hortus III" and "Manual of Cultivated Plants," and ensure that all specimens are true to type, name, etc., as described therein. For the standard nomenclature, refer to the publication of the American Joint Committee on Horticultural Nomenclature, "Standardized Plant Names."

**580-2.1.2 Grade Standards and Conformity with Type and Species:** Only use nursery grown plant material except where specified as Collected Material. Use nursery grown plant material that complies with all required inspection, grading standards, and plant regulations in accordance with the latest edition of the Florida Department of Agriculture's "Grades and Standards for Nursery Plants".

Except where a lesser grade might be specifically specified in the plans, ensure that the minimum grade for all trees and shrubs is Florida No. 1. Ensure that all plants are the proper size and grade at the time of delivery to the site, throughout the project construction period and during any designated plant establishment period.

Ensure that plant materials are true to type and species and that any plant materials not specifically covered in Florida Department of Agriculture's "Grades and Standards for Nursery Plants" conform in type and species with the standards and designations in general acceptance by Florida nurseries.

Ensure that plant materials are shipped with tags stating the botanical and common name of the plant.

**580-2.1.3 Inspection and Transporting:** Move nursery stock in accordance with all Federal and State regulations therefor, and accompany each shipment with the required inspection certificates for filing with the Engineer.

**580-2.2 Water:** Water used in landscaping operations may be obtained from any approved source. Ensure that water is free of any substance which might be detrimental to plant growth. The use of effluent water is subject to approval and must meet all Federal, State and Local requirements.

### **580-3 Specific Requirements for the Various Plant Designations.**

#### **580-3.1 Balled-and-Burlapped Plants (B&B), and Wired Balled-and-Burlapped (WB & B):**

**580-3.1.1 General:** Properly protect the root ball of these plants until planting them. The Engineer may reject any plant which shows evidence of having been mishandled.

Set the B&B and WB&B plants then remove the top 2/3 of all wire, rope, and binding surrounding the plant. Remove the burlap from the top 4 inches of the root ball. Do not disturb the root ball in any way. Bare root material is not allowed for substitution.

At least 90 days before digging out B & B and WB & B plants, root-prune those 1 1/2 inches or greater in diameter and certify such fact on accompanying invoices.

**580-3.1.2 Provisions for Wiring:** For plants grown in soil of a loose texture, which does not readily adhere to the root system (and especially in the case of large plants or trees), the Engineer may require WB & B plants. For WB & B plants, before removing the plant from the excavated hole, place sound hog wire around the burlapped ball, and loop and tension it until the tightened wire netting substantially packages the burlapped ball such as to prevent disturbing of the loose soil around the roots during handling.

**580-3.2 Container-Grown Plants (CG):** The Engineer will not accept any CG plants with roots which have become pot-bound or for which the top system is too large for the size of the container. Fully cut and open all containers in a manner that will not damage the root system. Do not remove CG plants from the container until immediately before planting to prevent damage to the root system.

**580-3.3 Collected Plants (Trees and Shrubs) (C):** Use C plants which have a root ball according to "Florida Grades and Standards for Nursery Plants". Do not plant any C plant before the Engineer's inspection and acceptance at the planting site.

**580-3.4 Collected Plants (Herbaceous) (HC):** The root mass and vegetative portions of collected herbaceous plants shall be as large as the specified container-grown equivalent. Do not plant any collected plant before inspection and acceptance by the Engineer.

**580-3.5 Specimen Plants (Special Grade):** When Specimen (or Special Grade) plants are required, label them as such on the plant list, and tag the plant to be furnished.

**580-3.6 Palms:** Wrap the roots of all plants of the palm species before transporting, except if they are CG plants and ensure that they have an adequate root ball structure and mass for healthy transplantation as defined in "Florida Grades and Standards for Nursery Plants".

The Engineer will not require burlapping if the palm is carefully dug from marl or heavy soil that adheres to the roots and retains its shape without crumbling. During transporting and after arrival, carefully protect root balls of palms from wind and exposure to the sun. Muck grown palms are not allowed. After delivery to the job site, if not planting the palm within 24 hours, cover the root ball with a moist material. Plant all palms within 48 hours of delivery to the site.

Move sabal and coconut palms in accordance with the "Florida Grades and Standards for Nursery Plants."

**580-3.7 Substitution of Container-Grown (CG) Plants:** With the Engineer's approval, the Contractor may substitute CG plants for any other root classification types, if he has met all other requirements of the Contract Documents.

#### **580-4 Planting Requirements.**

**580-4.1 Layout:** Prior to any excavation or planting, mark all planting beds and individual locations of palms, trees, large shrubs and proposed art and architectural structures, as shown in the plans, on the ground with a common bright orange colored spray paint, or with other approved methods, within the project limits. Obtain the Engineer's approval and make necessary utility clearance requests.

**580-4.2 Excavation of Plant Holes:** Excavate plant holes after an area around the plant three times the size of the root ball has been tilled to a depth of the root ball. Ensure that the plant hole is made in the center of the tilled area only to the depth of the plant root ball.

Where excess material has been excavated from the plant hole, use the excavated material to backfill to proper level.

**580-4.3 Setting of Plants:** Center plants in the hole. Lower the plant into the hole so that it rests on a prepared hole bottom such that the roots are level with, or slightly above, the level of their previous growth and so oriented such as to present the best appearance.

Backfill with native soil, unless otherwise specified on the plans. Firmly rod and water-in the backfill so that no air pockets remain. Apply a sufficient quantity of water immediately upon planting to thoroughly moisten all of the backfilled earth. Keep plants in a moistened condition for the duration of the planting period.

When so directed, form a water ring 6 inches in width to make a water collecting basin with an inside diameter equal to the diameter of the excavated hole. Maintain the water ring in an acceptable condition.

**580-4.4 Special Bed Preparation:** Where multiple or mass plantings are to be made in extended bedding areas, and the plans specify Special Bed Preparation, prepare the planting beds as follows:

Remove all vegetation from within the area of the planting bed and excavate the surface soil to a depth of 6 inches. Backfill the excavated area with peat, sand, finish soil layer material or other material to the elevation of the original surface. Till the entire area to provide a loose, friable mixture to a depth of at least 8 inches. Level the bed only slightly above the adjacent ground level. Then mulch the entire bedding area, in accordance with 580-8.

#### **580-5 Staking and Guying.**

**580-5.1 General:** When specified in the plans, or as directed by the Engineer, stake plants in accordance with the following.

Use wide plastic, rubber or other flexible strapping materials to support the tree to stakes or ground anchors that will give as the tree moves in any direction up to 30 degrees. Do not use rope or wire through a hose. Use guy chords, hose or any other thin bracing or anchorage material which has a minimum 12 inches length of high visibility flagging tape secured to guys, midway between the tree and stakes for safety.

Stake trees larger than 1 inch diameter and smaller than 2 inches diameter with a 2 by 2 inch stake, set at least 2 feet in the ground and extending to the crown of the plant. Firmly fasten the plant to the stake with flexible strapping materials as noted above.

**580-5.2 Trees of 2 to 3 1/2 inches [50 to 90 mm] Caliper:** Stake all trees, other than palm trees, larger than 2 inches caliper and smaller than 3 1/2 inches caliper with two 2 by 4 inch stakes, 8 feet long, set 2 feet in the ground. Place the tree midway between the stakes and hold it firmly in place by flexible strapping materials as noted above.

**580-5.3 Large Trees:** Guy all trees, other than palm trees, larger than 3 1/2 inches caliper, from at least three points, with flexible strapping materials as noted above.

Anchor flexible strapping to 2 by 4 by 24 inch stakes, driven into the ground such that the top of the stake is at least 3 inches below the finished ground.

**580-5.4 Special Requirements for Palm Trees:** Brace palms which are to be staked with three 2 by 4 inch wood braces, toe-nailed to cleats which are securely banded at two points to the palm, at a point one third the height of the trunk. Pad the trunk with five layers of burlap under the cleats. Place braces approximately 120 degrees apart and secure them underground by 2 by 4 by 12 inch stake pads.

**580-6 Tree Protection and Root Barriers.**

Install tree barricades when called for in the Contract Documents or by the Engineer to protect existing trees from damage during project construction. Place barricades at the drip line of the tree foliage or as far from the base of the tree trunk as possible. Barricades shall be able to withstand bumps by heavy equipment and trucks. Maintain barricades in good condition.

When called for in the Contract Documents, install root barriers or fabrics in accordance with the details shown.

**580-7 Pruning.**

Prune all broken or damaged roots and limbs in accordance with established arboriculture practices. When pruning is completed ensure that all remaining wood is alive. Do not reduce the size or quality of the plant below the minimum specified.

**580-8 Mulching.**

Uniformly apply mulch material, consisting of wood chips (no Cypress Mulch is allowed), pine straw, compost, or other suitable material approved by the Engineer, to a minimum loose thickness of 3 inches over the entire area of the backfilled hole or bed within two days after the planting. Maintain the mulch continuously in place until the time of final inspection.

**580-9 Disposal of Surplus Materials and Debris.**

Dispose of surplus excavated material from plant holes by scattering or otherwise as might be directed so that it is not readily visible or conspicuous to the passing motorist or pedestrian. Remove all debris and other objectionable material from the site and clean up the entire area and leave it in neat condition.

**580-10 Contractor's Responsibility for Condition of the Plantings.**

Ensure that the plants are kept watered, that the staking and guying is kept adjusted as necessary, that all planting areas and beds are kept free of weeds and undesirable plant growth and that the plants are maintained so that they are healthy, vigorous, and undamaged at the time of acceptance.

**580-11 Plant Establishment Period.**

If the Contract Documents designate a Plant Establishment Period, assume responsibility for the proper maintenance, survival and condition of all landscape items during such period at no additional cost.

**580-12 Method of Measurement.**

The quantities to be paid for will be the items shown in the plans, completed and accepted.

**580-13 Basis of Payment.**

Prices and payments will be full compensation for all work specified in this Section.



# Florida Department of Environmental Protection

Central District  
3319 Maguire Boulevard, Suite 232  
Orlando, Florida 32803-3767

Rick Scott  
Governor

Carlos Lopez-Cantera  
Lt. Governor

Jonathan P. Steverson  
Secretary

## NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

**PERMITTEE:**

City of Fruitland Park  
Charlie Rector, Director  
506 W Berckman Street  
Fruitland Park, FL 34731

**PERMIT NUMBER:**

0301788-003

**ISSUE DATE:**

September 17, 2015

**EXPIRATION DATE:**

September 16, 2020

**COUNTY:**

Lake

**PROJECT NAME:**

CR 466A Phase 1

**CONNECTED TO:**

Fruitland Park

**FACILITY ID:**

FLA374245

Dear Mr. Rector:

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our office received the Notice on and associated fee on September 17, 2015.

*This is to advise you that the Department does not object to your use of such General Permit.*

Please note the attached requirements apply to your use of this General Permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation will subject the permittee to enforcement action and possible penalties.

Sincerely,

A handwritten signature in cursive script that reads "Charles LeGros".

Charles LeGros  
Engineer  
Wastewater Permitting

CRL/

cc: Charlie Rector, Director (via email: [crector@fruitlandpark.org](mailto:crector@fruitlandpark.org) )  
Duane K. Booth, PE (via email: [duanebooth@besandh.com](mailto:duanebooth@besandh.com) )  
Charles LeGros, DEP (via email: [charles.legros@dep.state.fl.us](mailto:charles.legros@dep.state.fl.us))

## REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at: <http://www.dep.state.fl.us/legal/Rules/shared/62-4/62-4.pdf> [62-4.540]
2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. [62-604.600(6)(b)1]
3. This general permit cannot be revised, except to transfer the permit. [62-604.600(6)(b)2]
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. [62-4.030]
5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Central District Office Form 62-604.300(8)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: <http://www.dep.state.fl.us/water/wastewater/forms.htm> [62-604.700(2)]

**Please submit the entire clearance document package in electronic format to DEP\_CD@dep.state.fl.us, with a copy to Charles.LeGros@dep.state.fl.us.** If the file is very large, you may post it to the Wastewater Electronic Applications folder on the following ftp site at:

<ftp://ftp.dep.state.fl.us/pub/wastewater/>

After posting the document, send an e-mail to DEP\_CD@dep.state.fl.us, with a copy to Charles.LeGros@dep.state.fl.us, alerting us that it has been posted.

Any submitted drawings (should be sized 11" x 17") and the engineer of record's signed seal and dates on the required document must be legible for acceptance. Documents requiring signing and sealing must be certified as required by FBPE for electronic submittals. Please refer to the DEP SOP found on our website for procedures:

<http://www.dep.state.fl.us/water/wastewater/dom/forms/ElectronicSubmissionInstructionsDOM.pdf>  
<http://www.dep.state.fl.us/water/wastewater/docs/InstructionsIndependentDocumentsEngineerLetter.pdf>

For further clarification contact:  
Chuck LeGros (407) 897-4158  
3319 Maguire Blvd, Suite 232  
Orlando, Florida 32803-3767

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. [62-604.700(3)]
7. Abnormal events shall be reported to the Department's Central District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800)320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Central District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. [62-604.550]



# Florida Department of Environmental Protection

Central District  
3319 Maguire Boulevard, Suite 232  
Orlando, Florida 32803-3767

Rick Scott  
Governor

Carlos Lopez-Cantera  
Lt. Governor

Jonathan P. Steverson  
Secretary

## Notification of Acceptance of Use of a General Permit

**Permittee:**

Charlie Rector, Community Dev. Director  
City of Fruitland Park  
506 W. Berckman Street  
Fruitland Park, FL 34731  
[rector@fruitlandpark.org](mailto:rector@fruitlandpark.org)

**Permit Number:** 0080480-061-DSGP

**Issue date:** September 14, 2015

**Expiration Date:** September 13, 2020

**County:** Lake

**Project Name:** CR 4661 Phase 1 WM Alterations

**Water Supplier:** City of Fruitland Park

**PWS ID:** 3350427

**PWS Type:** Community

Dear Mr. Rector:

On September 14, 2015, the Florida Department of Environmental Protection received a "Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs" [DEP Form No. [62-555.900\(7\)](#)], under the provisions of Rule [62-4.530](#) and Chapter [62-555](#), Florida Administrative Code (F.A.C.). The proposed project includes the construction of +/- 2,456 linear feet (LF) of 12-inch PVC water main and +/-50 LF of 8-inch water main for re-building of CR 466 A. The project is located on the east side of CR 466A and west of US Highway 27/441.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule [62-555.405, F.A.C.](#), all applicable rules in Chapters [62-4](#), [62-550](#), [62-555](#), F.A.C., and the General Conditions for All General Drinking Water Permits (found in [62-4.540, F.A.C.](#)).

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation.

Pursuant to Rule [62-555.345, F.A.C.](#), the permittee shall submit a certification of construction completion [DEP Form No. [62-555.900\(9\)](#)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form [62-555.900\(8\), F.A.C.](#), with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

Permittee:  
City of Fruitland Park  
Charlie Rector, Community Dev. Director  
Page 2

DEP File No.:  
0080480-061-DSGP

When any existing asbestos cement (AC) pipes are replaced under this permit, the permittee shall do so in accordance with the applicable rules of the Federal Asbestos Regulation and Florida DEP requirements. For specific requirements applicable to AC pipes, the permittee should contact Mary Lawrence of the Central District Compliance and Assurance Program at (407).897.4179 prior to commencing any such activities. Please be aware that a notification is required to be submitted to the Department for a regulated project.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule [62-4.030, F.A.C.](#)

Sincerely,



Caroline Shine, Environmental Administrator  
Drinking Water/Environmental Resource Permitting  
Permitting and Waste Cleanup Program  
FDEP, Central District  
(407) 897-2927

cc: Duane K. Booth, P.E., Booth, Ern, Straughan & Hiott, Inc. [[duanebooth@besandh.com](mailto:duanebooth@besandh.com)]  
Daissan a. Villareal, FDEP

## CLEARANCE REQUIREMENTS

Requirements for clearance upon completion of projects are as follows:

**1) Clearance Form**

Submission of a fully completed Department of Environmental Protection (DEP) Form [62-555.900\(9\)](#) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation* and a copy of this general permit notification.

**2) Record Drawings, if deviations were made**

Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings and specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

**3) Bacteriological Results**

Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules [62-555.315\(6\)](#), [62-555.340](#), and [62-555.330](#), F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- *The proposed main at all points of connection to the existing main*
- *At all terminal ends of the proposed water mains.*
- *On straight run of pipes between two isolation valves. The maximum interval between two sampling locations shall be 1,200 ft.*
- *Beginning and end of lines for each segment to be partially completed.*

Per AWWA C651, samples shall not be taken from fire hydrants.

Each location shall be sampled on two consecutive days, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided.

Please submit the entire clearance document package in electronic format to [DEP\\_CD@dep.state.fl.us](mailto:DEP_CD@dep.state.fl.us), with a copy to [Daissan.A.Villareal@dep.state.fl.us](mailto:Daissan.A.Villareal@dep.state.fl.us), and [Caroline.Shine@dep.state.fl.us](mailto:Caroline.Shine@dep.state.fl.us). If the file is very large, you may post it to the Water Electronic Submittal folder on the Central District's ftp site at: [ftp://ftp.dep.state.fl.us/pub/incoming/Central\\_District/Water%20Electronic%20Applications](ftp://ftp.dep.state.fl.us/pub/incoming/Central_District/Water%20Electronic%20Applications).

After posting the document, send an e-mail to [DEP\\_CD@dep.state.fl.us](mailto:DEP_CD@dep.state.fl.us), with a copy to [Daissan.A.Villareal@dep.state.fl.us](mailto:Daissan.A.Villareal@dep.state.fl.us), and [Caroline.Shine@dep.state.fl.us](mailto:Caroline.Shine@dep.state.fl.us), alerting us that it has been posted.

Any submitted drawings (should be sized 11" x 17") and the engineer of record's signed seal and dates on the required document must be legible for acceptance. Documents requiring signing and sealing must be certified as required by FBPE for electronic submittals. Please refer to the DEP SOP found on our website for procedures:

<http://www.dep.state.fl.us/water/drinkingwater/forms/ElectronicSubmissionInstructions-SDW.pdf>  
<http://www.dep.state.fl.us/water/wastewater/docs/InstructionsIndependentDocumentsEngineerLetter.pdf>  
Forms: <http://www.dep.state.fl.us/water/drinkingwater/forms.htm>

**For further clarification contact:** Daissan A. Villareal (407) 897-4129  
3319 Maguire Blvd, Suite 232, Orlando, Florida 32803-3767

**TECHNICAL SPECIAL PROVISIONS**

**for**

**THE CITY OF FRUITLAND PARK  
C.R. 466A PHASE 1 UTILITY RELOCATION**

<b>Prepared By</b>	<b><u>Duane K. Booth, P.E., #44631</u></b>
<b>Date</b>	<b><u>January 28, 2016</u></b>
<b>Pages</b>	<b><u>1-31</u></b>

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**SECTION 3000  
CONTRACT ADMINISTRATION**

**3000-1 GENERAL**

Provide all necessary surveying, testing, utility coordination, record data, shop drawings and material submittals, and warranty. Provide test results at completion of the test. Submit shop drawings and material submittals prior to placement of materials.

**3000-2 STAKING/SURVEY REQUIREMENTS, BY CONTRACTOR**

3000-2.1 Sanitary Sewer

Force mains shall be staked and graded at 50-foot intervals. All fittings, clean-outs and valves are to be staked and graded.

3000-2.2 Water Distribution System

The following shall be staked and graded.

- A) Fire Hydrants.
- B) All Fittings.
- C) Blow-Offs.
- D) Mains (stake at a minimum of 50-foot Intervals).
- E) Valves.

**3000-3 TESTING**

3000-3.1 General

- A) All testing except density testing shall be performed by the contractor and shall be in accordance with this Technical Special Provision.
- B) The selection of the testing laboratory and the costs of the testing shall be the responsibility of the Contractor. The laboratory must be FDEP and FDOT approved. Failed tests shall be handled as described in Section 5-9 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction (2010) as amended.
- C) The scheduling of the test with the testing laboratory shall be the responsibility of the Contractor. Prior to any section of the work being cut over and connected to the City of Fruitland Park system, that section shall be tested and approved by the Engineer with advice from the City of Fruitland Park.
- D) Water needed for flushing of lines and testing, may, at the contractor's expense, be purchased from the City of Fruitland Park. The contractor may rent a hydrant meter and pay normal City of Fruitland Park rates for water. The cost for installation and rental of the hydrant meter is \$105.00, and the water rates include a base rate of \$13.60 per month, for up to 3,000 gallons per month. Usage above 3,000 gallons per month would

be charged to the contractor based on the City's tiered water rate structure. The City's tiered water rate structure is available at City Hall.

3000-3.2 Sanitary Sewer Force Mains

- A) The Contractor shall perform hydrostatic testing of all sanitary sewage force mains, as set forth in this Technical Special Provision, and shall conduct said test in the presence of the Engineer and the City of Fruitland Park with 48 hours advance notice provided to the Engineer.
- B) Piping and appurtenances to be tested shall be within sections between valves or adequate plugs, not exceeding 2000-feet with prior approval from the Engineer. Testing shall not proceed until all joint restraining devices are installed. All piping shall be thoroughly cleaned and flushed prior to testing to clear the lines of all foreign matter. While the piping is being filled with water, care shall be exercised to permit the escape of air from extremities of the test section, with additional release cocks provided if required.
- C) Hydrostatic testing shall be performed at 100-psi for all sizes of force mains. The testing procedure shall continue for an uninterrupted period of not less than two hours. Testing shall be in accordance with the applicable AWWA provisions for PVC-AWWA Publication M-23. The allowable rate of leakage shall be less than the number of gallons per hour determined by the following formulas.

$$L = \frac{SDP^{1/2}}{148,000}$$

20' pipe length

$$L = \frac{SDP^{1/2}}{133,200}$$

18' pipe length

L = allowable leakage in gallons per hour

S = length of pipe tested, in feet

D = nominal diameter of the pipe in inches

P = average test pressure maintained during the leakage test in PSIG

- 1) The testing procedure shall include the continued application of the specified pressure to the test system, for the two hour period by way of a pump taking supply from the container suitable for measuring water loss. The amount of loss shall be determined by measuring the volume displaced from said container.
- 2) Should the test fail, necessary repairs shall be accomplished by the Contractor and the test repeated until it is within the established limits. The Contractor shall furnish the necessary labor, water, pumps, gauges, and all other items required to conduct the required sanitary sewage force main testing and shall

perform the necessary system repairs required to comply with the specified hydrostatic test.

- 3) Pipe sections to be pressure tested shall be subjected to a hydrostatic pressure of 100-psi for a duration of two hours by means of a pump.

### 3000-3.3 Water Distribution Systems

- A) The Contractor shall perform hydrostatic testing of all water distribution systems, as set forth in the following and shall conduct said tests in the presence of the Engineer and the City of Fruitland Park, with 48 hours advance notice provided, in writing, to the Engineer.
- B) Piping and appurtenances to be tested shall be within sections between valves, not exceeding 2,000-feet unless alternate methods have received prior approval from the Engineer. Testing shall not proceed until all joint restraining devices are installed. All piping shall be thoroughly cleaned and flushed prior to testing to clear the lines of all foreign matter. While the piping is being filled with water, care shall be exercised to permit the escape of air from extremities of the test section, with additional release cocks provided if required.
  - 1) Hydrostatic testing shall be performed at 150-psi pressure, unless otherwise approved by the Engineer, for a period of not less than two hours. Testing shall be in accordance with the applicable AWWA provisions for PVC-AWWA Publication M-23 and for DIP-AWWA Standard C600, Section 4. The allowable rate of leakage shall be less than the number of gallons per hour determined by the following formulas:

**18' Pipe Length**

$$L = \frac{SDP^{\frac{1}{2}}}{133,200}$$

**20' Pipe Length**

$$L = \frac{SDP^{\frac{1}{2}}}{148,000}$$

L = allowable leakage in gallons per hour

S = length of pipe tested, in feet

D = nominal diameter of the pipe in inches

P = average test pressure maintained during the leakage test in PSIG

- 2) The testing procedure shall include the continued application of the specified pressure to the test system, for the two hour period, by way of a pipe taking supply from the container suitable for measuring water loss. The amount of loss shall be determined by measuring the volume displaced from said container.
- 3) Should the test fail, necessary repairs shall be accomplished by the Contractor and the test repeated until within the established

limits. The Contractor shall furnish the necessary labor, water pumps, gauges, and all other items required to conduct the required water distribution system testing and perform necessary repairs.

- 4) Pipe sections to be pressure tested shall be subjected to a hydrostatic pressure of 150-psi for a duration of two hours by means of a pump.

#### 3000-3.4 Disinfecting Water Distribution System

- A) Following the pressure testing, the Contractor shall disinfect all sections of the water distribution system, and receive approval thereof from the appropriate agencies, prior to placing in service. Advance notice shall be provided to the Engineer, who will notify the City of Fruitland Park Utilities, before disinfecting procedures start. The disinfection shall be accomplished with the applicable provisions of AWWA Standard C651, "Disinfecting Water Mains" and all appropriate agency approvals. Computation of the amounts of chlorine to be used for disinfection shall be approved by the Engineer with advice from the City of Fruitland Park.
- B) Care shall be taken to provide disinfection to the total system, and extremities shall be carefully flushed prior to chlorination. Water for flushing shall be provided by the Contractor. After disinfection and final flushing have been accomplished, two (2) samples of water for bacteriological analysis shall be collected and submitted as directed by the Engineer with advice from the City of Fruitland Park. These samples shall be collected at specified locations, as shown in the construction plans. Should these samples or subsequent samples prove to be unsatisfactory, then the piping shall be disinfected until sufficient number of satisfactory samples are obtained.
- C) The Contractor shall furnish all temporary jumper connections equipment and materials and perform the work necessary for the disinfecting procedures, including additional disinfection as required.

### 3000-4 COORDINATION OF UTILITY SERVICES

#### 3000-4.1 Location of Existing Utilities

Locations of underground utilities are shown from information received from the various utility owners and from DRMP under FDOT Roadway Project ID #238395-4-52-01. The locations or elevations of utilities are not represented to be exact and are shown for the convenience of the Contractor. The Contractor shall contact the utility owner of concern for any available additional information and coordinate his construction activities accordingly. Contractor shall coordinate with existing utility owners for protection and/or support of their facilities. Any cost incurred for the protection of existing underground utilities will be considered as part of the unit price for pipe installation paid to the Contractor.

#### 3000-4.2 Maintenance of Service

The public and private utilities including water, gas, storm drain, sewer lines, electrical conduit, power lines, telephone, cable tv, and appurtenant plant and facilities, are and must be kept in continuous operation, and all work hereunder must be so conducted as to avoid interference with or interruption in the operation of same, and shall be started and completed in the shortest practicable time, in order that these additional contemplated facilities may be available for use without delay. All work hereunder must be so conducted so as to avoid interference or interruption in travel of streets, alleys, or individual access ways. In order to secure these results, the order of procedure and methods of conducting work shall at all times be subject to the approval of the Engineer without in any way relieving the Contractor of responsibility for same.

The cost of any temporary bypasses required to maintain uninterrupted City of Fruitland Park utility service shall be included in the bid price for the City of Fruitland Park utilities. This shall include, but not be limited to, the cost of bacteriological analyses required for temporary bypasses, reimbursement to the City of Fruitland Park Utilities for actual costs of advertising, boil water notices, interruption of service notices, staff time for such, and other related work.

The Contractor shall schedule his work in such a way as to avoid creating conflicts between any existing or proposed City of Fruitland Park utilities and any other work to be performed under this Contract.

In the event that the roadway construction is in phases, all City of Fruitland Park utility work associated with that phase must be included in the Traffic Control Plan. This shall include any work that is required to be done outside of the phase of construction which is required to be done to the City of Fruitland Park utility in order to maintain uninterrupted utility service.

All existing utilities which are to be removed from service shall be physically removed from the project site. No utility removed from service shall remain in place.

#### 3000-4.3 Protection and Support of Utilities

The Contractor shall be responsible for protecting, maintaining and supporting all existing and proposed City of Fruitland Park utilities during the course of executing the work under this Contract. This shall include protecting, maintaining and supporting all existing and proposed utilities before, during and after work is completed in the vicinity of any City of Fruitland Park utilities. No additional compensation for this work is to be provided. Contractor shall include these costs in the unit prices of the utilities.

In the event that the Contractor should damage a City of Fruitland Park utility line, the Contractor shall be responsible for repairing the damage at no additional cost to the City of Fruitland Park. Said repair work shall be completed within the following time frames: Water Line, two hours from time of damage, Gravity Sewer Line, 2 hours from time of damage, Sanitary Force Main, 1 hour from time of damage. Should the Contractor not complete the repairs in the time allotted above, the City of Fruitland Park shall make the repair to the utility in order to restore utility service. However, the Contractor shall reimburse the City of

Fruitland Park for said repairs at a rate of \$100/hour/employee, plus material costs. Any related expenses such as rental of equipment, hauling of sewage, bacteriological sampling, disinfection, or other related work, shall also be reimbursable at the cost to the City of Fruitland Park.

**3000-5 AUTHORITY AND DUTIES OF INSPECTOR**

3000-5.1 General

Inspectors employed by the City of Fruitland Park, under the direction of the City's Public Works Director, shall be authorized to inspect all work done and all materials furnished. Such inspection may extend to any or all parts of the work and to the preparation, fabrication or manufacture of the materials to be used.

**3000-6 RECORD DATA AND AS-BUILTS**

3000-6.1 General

The Contractor shall maintain during the progress of the project accurate records of the location, length and elevation of all pipe and piping installed. Prior to final acceptance and after the connection of any portion of the work to the City of Fruitland Park system, the Contractor shall deliver to the Engineer, who will forward to the City, certified as-built drawings in reproducible mylar 11" x 17" format with accurate notations recorded thereon.

3000-6.2 Requirements

As-Built drawings showing the elevations and horizontal alignment of all newly installed lines at 50 foot stations and at every fitting and every change in alignment to ensure compliance with these plans. The location and elevation of manholes, valves, tees, crosses, and bends shall be dimensioned to the station and offset. Information to be shown for sanitary sewer wyes shall include the distance to the nearest manhole, length of service line, and building number served. Elevations of potable water main at crossings of sanitary hazards shall be provided for top of pipe for the lower utility and bottom of pipe for the upper utility.

3000-6.3 Submittal

As-Built Drawings shall be submitted in reproducible mylar 11" x 17" format and shall be certified by a Professional Land Surveyor registered in the State of Florida. As-Built Drawings shall also be provided to the City of Fruitland Park on a compact disc, in ACAD .dwg file format.

3000-6.4 Acceptance

Portions of the project shall not be considered to be finally accepted until record drawings for that portion have been submitted and accepted by the Engineer and the City of Fruitland Park.

As-built drawings shall be submitted to the City of Fruitland Park accompanying satisfactory bacteriological sampling results and FDEP clearances prior to the monthly progress payment cutoff. Any work for which the City of Fruitland Park

has not received satisfactory bacteriological sampling results, FDEP clearances and record drawings as required in Section 3000-6 through Section 3000-6.4 of this Technical Special Provision shall not be eligible for payment until such information is provided.

**3000-7 SHOP DRAWINGS AND MATERIAL SUBMITTALS**

3000-7.1 General

Contractor shall submit all shop drawings and material submittals to the Engineer, who will forward to the City of Fruitland Park's designated representative.

**3000-8 CONTRACTOR WARRANTY**

3000-8.1 General

In addition to any warranties implied by law and to any manufacturers' or distributors' warranties assigned to the Department, the Contractor hereby warrants that the materials and installation of materials shall conform to all samples and shop drawings provided and shall be free from defects in materials and workmanship for a period of one (1) year following the date of final acceptance.

This warranty shall apply to each component of any assembly and to any assembly as a whole. In the event a defect, malfunction, or other failure not caused by misuse or third party acts not contemplated occurs during the warranty period, the Contractor shall repair the warranted item if repair can be made on site within a reasonable time from receipt of notice of the occurrence. If repair cannot be made within a reasonable time from receipt of notice of the occurrence the Contractor shall replace the warranted item onsite within a reasonable time from receipt of notice of the occurrence. In determining a reasonable time for repair or replacement, matters unique to the Contractor, such as office location or availability of personnel, shall not be considered. In the event that the Department determines that public health, safety, or welfare requires temporary measures to continue safe functioning of the facility of which the warranted item is a part, the Contractor shall provide temporary items or take other temporary measures as the Department deems necessary. All repairs, replacements, and temporary measures shall be at the sole cost and expense of the Contractor, without any charge to the Department. If the Contractor fails to comply with the Contractor's obligation under this warranty, the contractor shall be liable to the Department for all damages associated with the contractor's breach hereof and damages associated with the initial occurrence from the date of the occurrence. Damages shall include, but shall not necessarily be limited to, costs incurred in repairing or replacing warranted items, as well as incidental and consequential damages suffered by the Department.

Prior to final acceptance and payment for the Utility Relocation work, Contractor shall provide to the City of Fruitland Park a Maintenance Bond with a total value of 10% of the Utility Relocation work performed under the Contract. The Bond shall be valid for one year, coincident with the Warranty. The Bond shall be payable to the City of Fruitland Park. In the event that work to be performed under the above stated warranty is required, the City of Fruitland Park will

request such work in writing. The Contractor shall then be required to mobilize to the site within 14 calendar days, and have the warranty work completed within 30 calendar days. Should the Contractor not respond as required above, the City of Fruitland Park shall complete the repairs and bill the Contractor for the work completed at an hourly rate of \$100.00, plus materials. Payment from the Contractor for any warranty work completed by the Contractor shall be reimbursed to the City of Fruitland Park within 30 days. Should reimbursement for such work not be received within 30 days, the City of Fruitland Park shall begin the process to recoup the monies by calling the Contractors Maintenance Bond.

**SECTION 3100  
UTILITY EXCAVATION, TRENCHING AND BACKFILLING**

**3100-1 GENERAL**

Construct proper trench, prepare utility pipe bedding and backfill of the new water and sewer utility pipe.

**3100-2 WORKMANSHIP**

3100-2.1 Utility Bedding

- A) Class B (Minimum Utility Bedding): The bottom of the trench shall be shaped to provide a firm bedding for the pipe. The pipe shall be firmly bedded in undisturbed soil, or hand shaped so that the pipe will be in continuous contact therewith for its full length.
- B) Class A (Special Utility Bedding): Should special bedding be required due to depth of cover, impact loadings, or other conditions, bedding methods shall receive prior approval by the Engineer.

3100-2.2 Dewatering

Utilities shall be laid "in the dry" unless otherwise approved by the Engineer. Dewatering systems shall be utilized in accordance with good standard practice and must be efficient enough to lower the water level in advance of the excavation and maintain it continuously to keep the trench bottom and sides firm and dry.

3100-2.3 Roadway and Pavement Restoration

Pavement or roadway surfaces cut or damaged shall be replaced by the Contractor in accordance with the Contract Documents.

3100-2.4 Protection and Restoration Property

During the course of construction, the Contractor shall take special care and provide adequate protection in order to minimize damage to vegetation, surfaced areas, utilities, and structures within the construction right-of-way, easement or site, and take full responsibility for repair thereof.

**SECTION 3200  
PIPE, FITTINGS, VALVES AND APPURTENANCES**

**3200-1 GENERAL**

Construction of water and sewer utility utilizing the material and installation standards for pipe, fittings, valves and appurtenances specified in this Technical Special Provision. Required specialty items not included under this Section shall be high quality and consistent with approved standards of the industry for the applicable service installation. All material to be furnished by the Contractor with exception of meters and meter couplings.

**3200-2 PIPE AND FITTINGS**

3200-2.1 General

All pipe and fittings shall be clearly marked with the name or trademark of the manufacturer, pressure rating, thickness or pressure class, and the nominal pipe diameter. All pipe and fittings shall be adequate for 150-psi working pressure and shall meet all applicable AWWA specifications. All pipe installations shall have indicator tape run directly on top of pipe to indicate the purpose of piping (water, sewer, force main) and copper tracing wire, located within 1-inch of the top of pipe, for location purposes. Tracing Wire shall be eight gauge, single strand, UF rated (direct burial), copper wire.

3200-2.2 Cast and Ductile Iron

A) Pipe

Ductile iron pipe shall be in accordance with ANSI/AWWA C151/A21.51. Pipe shall be laid in accordance with ANSI/AWWA C150/A21.50. Ductile Iron pipe shall be Pressure Class 350.

B) Fittings

Cast and ductile iron pipe fittings shall conform to ANSI/AWWA C110/A21.10 and ANSI/AWWA C153/A21.53 and shall have a minimum working pressure of 250-psi. Fittings shall be UL/FM approved and shall be compact fittings. All underground fittings shall be mechanical joint.

C) Joints

1) Mechanical Joints

All jointing materials for mechanical joints shall be provided by the pipe or fitting manufacturer. Material assembly and bolting shall be in accordance with ANSI Specification A21.11 (AWWA C111). All glands shall be made of ductile iron only. Mechanical joint gaskets in sewage lines shall be of a composition suitable for exposure to sewage, sludge, or scum within the pipe.

- 2) Push-On joints shall be in accordance with ANSI A21.11/AWWA C111. All jointing materials shall be provided by the pipe or fitting manufacturer and installation shall be in accordance with the manufacturer's recommended practice.
  - 3) Restrained joint assemblies with mechanical joint pipe shall be Mechanical Joint Retainer Glands, "locked-type" joints of Megalug or approved equal. The restrainer shall meet or exceed all the requirements of ANSI A21.11/AWWA C111 and ASTM A536. The restrainer system shall provide anchoring of the pipe to mechanical joint fittings or bell to spigot pipe joints. Restraints shall provide a full 360 degree contact with sufficient gripping action to secure the clamp to the pipe and be designed so that restraint action is increased as a result of increases in line pressure.
  - 4) Flanged connections shall be in accordance with ANSI A21.15/AWWA C115, 56.7 kg standard.
  - 5) No leaded joints or connection of any kind will be permitted.
- D) Coatings and Linings
- 1) Cast and ductile iron pipe and fittings for force mains or when used as gravity sewer service shall receive an interior coal tar epoxy lining for both pipe and fittings in accordance with AWWA C210.
  - 2) Cast and ductile iron pipe and fittings for water service shall be cement mortar lined in accordance with ANSI A21.4/AWWA C104.
  - 3) Cast and ductile iron pipe and fittings for water and sewer shall receive an exterior bituminous coating approximately 1 mil thick as specified in ANSI A21.51. The finished coating shall be continuously smooth, neither brittle when cold nor sticky when exposed to sunlight and be strongly adherent to the fitting. The coating shall be applied to the exterior of all pipe and fittings unless otherwise specified. All bolts, nuts, studs and other uncoated parts of joints for underground installation shall be coated with asphalt or coal-tar prior to backfilling. Coatings shall be applied in accordance with AWWA C110-fittings, AWWA C115-flanged pipe, and AWWA C151-ductile iron pipe.
  - 4) Special Exterior Protection for Corrosion
 

Extra protection shall be provided for underground cast or ductile iron pipe and fittings within areas of severe corrosive conditions. This shall be accomplished by the installation of polyethylene encasement, through the area of concern. The soil test evaluation to determine the necessity for extra protection in suspect areas shall be set forth in ANSI Standard A21.5. Additionally, where other existing utilities are known to be cathodically protected at cast or ductile iron pipe crossing, said utility shall be installed parallel to and within 10-feet of the crossing, protection shall also be provided. Steel pipe shall not be installed in severe corrosion areas.

3200-2.3 Polyvinyl Chloride (PVC)

A) Pipe

Pipe shall be manufactured from clean virgin Type 1, Grade 1 rigid, unplasticized polyvinyl chloride resin (Class 12454-A or Class 12454-B) conforming to ASTM D1784. The PVC compound shall have an established hydrostatic design basis (HDB) of 4000-psi as described in ASTM D2837. The pipe shall bear the National Sanitation Foundation (NSF) seal for potable water pipe.

- 1) Pipe with diameters of 3-inches or less shall be PVC1120 Schedule 80 and shall be in accordance with ASTM D1784 and D1785. Pipe is to be manufactured to I.P.S. (Steel) Standard Pipe equivalent outside diameters. The sustained pressure test shall be conducted in accordance with ASTM D1598 at test pressures given in ASTM D1785. The burst pressure test shall be conducted in accordance with ASTM D1599 at test pressures given in ASTM D1785. Potable water pipe shall be marked NSF-PW approved.
- 2) Pipe with diameters of 4-inches to 12-inches for water mains shall be PVC 1120, Class 150, DR 18 and shall be manufactured in accordance with AWWA Standard C900, latest revision. All pipe shall be hydrostatically proof tested at the factory in conformance with UNI-B-11 standards. In case of conflict between standards specified herein, the requirements of AWWA Standard C900 shall prevail. Pipe is to be manufactured to ductile iron pipe equivalent outside diameters. The pipe shall be designed to pass without failure a sustained pressure test of 500 psi in conformance with ASTM D1598 and a quick burst test of 755 psi in conformance with ASTM D1599. Pipe larger than 12" shall be in accordance with AWWA C-905, DR 25.
- 3) Pipe with diameters of 4-inches to 12-inches for sewer force mains shall be PVC 1120, Class 150, DR 18, and shall be manufactured in accordance with AWWA Specification C900 latest revision.
- 4) PVC Pipe colors shall be as follows:  
  
WATER – Blue or White  
SEWER - Green or White with Yellow stripes (Force Main)

B) Joints and Fittings

Connections and fittings for pipe 2-inches and smaller shall be Schedule 80 and shall have solvent welded sleeve type joint in accordance with ASTM D2672. The solvent cement shall comply with ASTM D2564, and the joint shall be made in accordance with ASTM D2855.

Fittings for pressure mains 3-inches and larger (water lines or sewage force mains) shall be cast iron or ductile iron with mechanical joint rubber compression ring type joints as described in Section 3200-2.2 B of this Technical Special Provision.

Joints for pressure mains 3-inches and larger (water lines or sewage force mains) shall be the manufacturer's standard push-on bell type with rubber sealing ring in accordance with ASTM D3139. Elastomeric gaskets shall conform to ASTM F477.

3200-2.4 Special Items

A) Tapping Saddles shall be of two types:

1) Stainless steel full circle sleeves as manufactured by Ro-Mac type SST, assuring a full circumferential seal. Sleeves shall be rated for 150-psi operating and 200-psi minimum test pressure and shall be all 304 stainless steel.

2) Mechanical Joint type with outlet, flange ANSI B16.11 125lb. standard. Mueller 1#615 or #715, assuring a full circumferential seal. Sleeves shall be rated for 200 psi minimum and shall conform to ASTM A126. The mechanical joint shall conform to Section 3200-2.2 (C). The sleeve shall be lined and coated in accordance with Section 3200-2.2 (D).

B) Service Saddles

Shall be as manufactured by Smith Blair Inc., Ford, or Rockwell. Units for cast or ductile iron and PVC pipe shall be double strap. Sealing gasket shall be BUNA-N rubber, and straps shall be stainless steel.

C) Water Service

Polyethylene plastic pipe or tubing for potable water service shall comply with AWWA C800 and AWWA C901, be approved for potable service by the National Sanitation Foundation, and bear the NSF seal. The product shall be rated for a minimum working pressure of 200-psi with a minimum Standard Dimension Ratio (SDR) of 9. Service lines shall be 1-inch for single and 1 ½-inches with 1-inch branch off for double service. All fittings shall be Mueller or Ford brass. Curb stops and corporate stops to be Mueller or Ford. Curb stops shall have padlock wings.

D) Pipe Couplings

The Contractor shall furnish and install pipe couplings as required to complete the work. Pipe couplings used to join two pieces of ductile iron pipe or PVC pipe shall be sized to match the outside diameter of the pipeline. Transition couplings shall be used to join pipes of different outside diameters. The coupling sleeve shall be manufactured of ductile iron conforming to ASTM A536 and be coated with 14 mils of epoxy. The bolts shall be manufactured of a metal of high corrosion resistance and shall conform to ANSI 21.11/AWWA C111. Gaskets shall be wedge-type and manufactured of virgin SBR for water and sewer service. The installation of all couplings shall be in accordance with the manufacturer's recommendations. After installation, all coupling surfaces including bolts and nuts, shall be coated with an approved coating as specified in this section of this Technical Special Provision. Couplers and adapters for polyethylene pipe shall be brass conforming to AWWA C800 and shall be female IPT, pack joint, or compression nut.

### 3200-3 VALVES

#### 3200-3.1 General

The valve type, size, rating, flow direction arrow if applicable, and manufacturer shall be clearly marked on each unit. Valves shall open left (counterclockwise) with an arrow cast in the metal of operation hand wheels and nuts indicating the direction of opening.

#### 3200-3.2 Valves for Underground Water Service

- A) Valves from 2-inches thru 12-inches for underground water service shall be iron body gate valves, non-rising stem type and shall be equipped with a 2-inch square cast iron operating nut with corrosion protection coating inside and out. Gate Valves shall be resilient seated valves which meet all C509 requirements of AWWA (water). Gate Valves shall be Mueller A2370-20, American Darling CRS80 or Clow.
- B) Valves larger than 12" shall be cast iron body, self-lubricated, rubber seated, one-piece stainless steel shaft, and capable of drip-tight shut-off at the rated pressure and meet AWWA C504. Valve operators shall conform to AWWA C504. Valve operator for buried or submerged installations shall be furnished with sealed enclosures. Valves shall be equipped with actuating nuts, cast iron handwheels or chain operator as appropriate for the installation and type of operator. Valves shall be installed in a vertical position. Valves and appurtenances shall be Dezurik Series 130, American-Darling 150 or Pratt.

#### 3200-3.3 Valves for Underground Sewer Service

Valves for wastewater application shall be cast iron body, full port, non-lubricated, eccentric type, with resilient faced plugs, and capable of drip-tight shut-off at the rated pressure if applied at either port in accordance with AWWA C606. Operation of all valves 8" or larger, and smaller sizes in exposed locations which require handwheels or chainwheels, shall be by approved gear actuators, equipped with position indicator and stop, and shall be furnished by the valve manufacturer. Gear actuators for buried or submerged installations shall be furnished with sealed enclosures. Valves shall be equipped with actuating nuts, cast iron handwheels or chain operators, with galvanized steel chains, as appropriate for the installation and type of operator. Valves and appurtenances shall be Series 100, as manufactured by DeZurik Corp. or Clow.

#### 3200-3.4 Sewage Combination Air Valve (SCAV)

##### A) Design

Single body, double orifice to allow large volumes of air to escape or enter pipe.

##### B) Materials

- 1) Body and Cover: ASTM 126 GRB Cast Iron
- 2) Float and Stem: ASTM A-240 Stainless Steel
- 3) Needle and Seat: Buna-N Nitrile Rubber

- 4) Plug: ASTM B-124 Bronze
- 5) Leverage frame: Delrin or Cast Iron ASTM D-1233

C) Isolation Valve

Cast iron plug valve or resilient seated gate valve.

D) Accessories

Blow-off valve and back flushing capabilities.

E) Manufacturer

APCO Series 440 SCAV or Val-Matic Series 800, appropriately sized for intended service or as indicated on the Drawings.

F) SCAV shall be installed in a concrete vault as shown on the plans.

3200-3.5 Valves Smaller than 2-inches

Valves smaller than 2-inches shall be bronze body gate valve conforming to Federal specifications 150-psi minimum working pressure with threaded joint equal to American 3 FG or Red and White 280 and Kitz Gate Valve. The use of this type of valve shall be approved by the Engineer with advice from City of Fruitland Park.

3200-3.6 Valve Boxes

The Contractor shall furnish and install a valve box for each buried valve. Boxes shall be adjustable, cast iron, minimum interior diameter of 5-inches, with covers cast with the applicable inscription in legible lettering on the top; "SEWER" or "WATER". Boxes shall be suitable for the applicable surface loading and valve size. Valve boxes not in the pavement shall have concrete pads around their tops, which will be flush with the top of the curb, with minimum dimensions of 24-inches x 24-inches x 6-inches and rebar as per plans.

3200-3.7 Fire Hydrants

Fire hydrants shall be of Mueller Super Centurion 200 oil reservoir, American Darling 6-inches B-84-B, 5 1/4-inches Clow Medallion UL/FM, or M&H fire rated.

Hydrants shall comply with AWWA Standard C502, "Fire Hydrants for Ordinary Water Works Service", and shall be equipped with a minimum of one pumper outlet nozzle 4 1/2-inches in diameter and two hose nozzles 2 1/2-inches in diameter. Units shall be traffic type with breakable safety clips or flange, and stem with safety coupling located below barrel break line to preclude valve opening. Hydrants shall be dry top type. Outlet nozzles shall be on the same plane, with minimum distances of 18-inches from center of nozzles to ground line. Valve shall be compression type with 5-1/4-inches minimum opening unless otherwise requested and show inlet connection to be 6-inches minimum.

## 3200-4        **INSTALLATION**

### 3200-4.1        General Requirements

- A) Piping, fittings, valves and appurtenances shall be constructed in accordance with the .
- B) Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe, scratching or marring machined surfaces, and abrasion of the pipe coating.
- C) Unless specifically designated on the plans, or so ordered by the Engineer, the pipe shall be buried to a depth to obtain at least 36" cover.
- D) Piping shall be installed along straight line and grade between fittings, manholes, or other defined points, unless definite lines of alignment, deflection or grade change have been established. The Contractor shall investigate well in advance of pipe laying any conflicts which may require readjustments in planned locations and advise the Engineer of the results of these investigations so that the Engineer may give instructions as to the modifications required. Modification to approved alignment or grade during construction shall receive prior approval from the Engineer with advice from City of Fruitland Park and all resulting design considerations shall be resolved by the Engineer.
- E) Care must be taken to fit the joints together properly so that the centers of the pipes shall be in a straight line. All adjustments to line and grade must be made by scraping away or filling in under the barrel of the pipe and not by wedging or blocking up any portion of the pipe. In no case shall the pipe be walked on either before or after the joints have been made. Any pipe that has its grade alignment or joints disturbed will be taken up and relaid. Pipe shall not be driven to grade by striking it with any unyielding object. Each section of pipe shall rest upon a pipe bed for the full length of its barrel, with recesses excavated to accommodate bells and joints. Any section of pipe already laid which is found to be defective or damaged shall be replaced with new pipe.
- F) Before and during installation, materials shall be cleaned and maintained clean, with all coatings protected from damage. The interior of the pipe shall be free of dirt and debris, and when work is not in progress, all open ends shall be plugged. Any sand or foreign material that enters the pipe shall be removed from the pipe immediately. No pipe shall be installed when trench conditions (standing water, excess mud, etc.) or the weather (rain, etc.) is unsuitable for such work, except by approval of the Engineer.
- G) Pipe, valves, fittings, or other items shall be inspected prior to installation, and any items showing a fracture or other defect shall be rejected. However, cast or ductile iron pipe showing an end crack, with no fracture indicated beyond the visible, may be salvaged by cutting off the damaged section 12-inches from the visible limits of the crack, provided the remaining pipe is sound. Any fitting or pipe which has received a severe blow that may have caused an incipient fracture, even though no fracture can be seen, shall be marked as rejected and removed at once from the work.

- H) Immediately after the pipe has been jointed and inspected, backfilling shall be placed to a minimum of 12-inches above the crown of the pipe to adequately protect the pipe from injury and movement, in accordance with ASTM D2321. Before and during the backfilling of any trench, precaution should be taken against flotation of pipe lines therein due to entry of large quantities of water into the trench which could cause uplift of the pipe line. The diameter deflection of PVC pipe shall not exceed five percent after completion and approval of construction, and through out the one year warranty period.
- I) Jointing shall be by an approved method and shall not require undue force to accomplish full satisfactory seating and assembly. Connections at structures shall be cut accurately and worked into place without being forced and shall align with the connecting point.
- J) All non-flanged fittings and valves shall be restrained using suitable tie rods and clamps, or restrained joint assemblies to support the fitting properly shall be provided. When tie-rods and/or clamps are used, they shall receive two heavy coats of bituminous paint to minimize corrosion.
- K) Water shall not be allowed in the trenches while the pipes are laid. The use of a well point dewatering system is a requirement on any runs of PVC pipe where such pipe will be below the groundwater elevation at the specific site. Sump and pump type trenching may be used only on short shallow runs where wellpoints would be impractical and excessively expensive. In all cases, density testing up to a point at least 25-mm (1-inch) above the water table shall be completed prior to removal of dewatering equipment. On sewer lines installed using wellpoints, service laterals shall be installed while the wellpoints are in operation
- L) Polyvinyl Chloride (PVC) pipe-lubrication and/or solvent for pipe and fitting joints shall be non-toxic (NSF approved for potable water). Following making, solvent type joints shall not be disturbed for five minutes and shall not have internal pressure applied for 24 hours or as recommended by the pipe manufacturer.
- M) All piping (PVC, Polyethylene tubing) shall have a type TWH insulated PVC copper conductor, #14 solid strand wire that strap and run with the pipe.

**SECTION 3300  
SANITARY SEWAGE FORCE MAIN**

**3300-1 GENERAL**

The provisions contained in this section include general requirements for the installation of sanitary sewer force main systems serving sanitary sewage pumping stations.

**3300-2 STANDARD REQUIREMENTS**

3300-2.1 General

The materials of construction and general installation procedures shall comply with the specific applicable standards set forth under Section 3100 "Utility Excavation, Trenching and Backfilling" and Section 3200, "Pipe, Fittings, Valves and Appurtenances" of this Technical Special Provision.

3300-2.2 Pipe Depth and Protection

A) Pipe Depth and Protection

The standard minimum cover for sewage force main systems shall be 3-feet from the top of the pipe to finish grade. Where this condition cannot be met, special consideration will be given.

B) Pipe Bedding

Special care shall be exercised to provide adequate bedding for the type of pipe used, taking into consideration trench width and depth, superimposed loadings above grade and the material below trench grade.

3300-2.3 Identification and Location

In order to preclude possible domestic water tapping, all installed underground sanitary sewage force mains shall be marked with a continuous green stripe located within the top 90 degrees of the pipe.

3300-2.4 System Connections

All connections and ties to the City of Fruitland Park's sewer system will be performed by the Contractor under the supervision of the Engineer and the City of Fruitland Park.

3300-2.5 Sanitary Sewer Force Main or Removal

A) Removal of Pipelines

When called for on the contract drawings, removal of existing pipelines shall mean complete removal of the existing pipeline and disposal of the pipe and appurtenances (valves, fittings, thrust blocks, etc.) not indicated to be salvaged. Backfill and compaction shall conform to standards set forth in the specifications. The Contractor is responsible for pumping out and flushing the gravity sewer

lines prior to placing them out of service. The Contractor must utilize a registered company / facility to dispose of the collected wastewater per FDEP Regulations.

**SECTION 3400  
WATER DISTRIBUTION SYSTEM**

**3400-1 GENERAL**

The provisions contained in this section include general requirements for the installation of water distribution systems for potable water service.

**3400-2 STANDARD REQUIREMENTS**

3400-2.1 General

The materials of construction and general installation procedures, shall comply with the specific applicable standards set forth under Section 3100, "Utility Excavation, "Trenching and Backfilling" and Section 3200, "Pipe, Fittings, Valves and Appurtenances" of this Technical Special Provision.

3400-2.2 Fire Hydrants

Hydrants shall be installed plumb and in true alignment with the connection pipes to the water main. They shall be securely braced against the end of the trench (undisturbed soil) with mechanical joint restraints. The gravel or crushed stone for the drain sump, followed by backfilling, shall be carefully placed and compacted. Installed hydrants shall be painted red for the final coat per NFPA 291, Chapter 3.

3400-2.3 Pipe Depth and Protection

The standard minimum cover for water distribution systems shall be 3 feet from the top of the pipe to finish grade, or as shown in .

3400-2.4 System Connections

All connections and ties to the City of Fruitland Park's water system and transfer of services will be performed by the Contractor under supervision of the Engineer and the City of Fruitland Park. Connections and tie-ins shall be coordinated with the City of Fruitland Park and the Engineer, and no disruptions to service shall be allowed between the hours of 7 am and 10 pm. All connections and tie-ins that shall cause interruptions to service shall be noticed to all affected customers by the Contractor no less than 48 hours prior to said interruption.

A) Water Service Connections

Connections to water mains 4 inches and larger shall be made by drilling the appropriate size hole and installation of service saddles, with services to smaller size mains accomplished by in-line fittings. Water service connections shall be installed per details in the plans. On curbed streets the exact location for each installed service shall be marked by etching or cutting a "W" in the concrete curb and painted blue with aerosol marking paint. Where no curb exists, locations shall be adequately marked by a blue stake or other method approved by the Engineer with advice from the City of Fruitland Park.

The Contractor shall be responsible for reconnection of any water meters, backflow prevention devices, backflow prevention device testing, etc., which is required as a part of the work in an area where an existing water line is being removed and replaced with a new water line.

B) Water Main Connections

All connections to existing mains will be made using couplings described in Section 3200, "Pipe, Fittings, Valves, and Appurtenances".

3400-2.5 Water Main Installation & Removal

A) Installation

When called for on the contract drawings, proposed pipelines shall be installed as shown. Backfill and compaction shall conform to the standards set forth in the specifications.

B) Removal

When called for on the contract drawings, removal of existing pipelines shall mean complete removal of the existing pipeline and disposal of the pipe and appurtenances (valves, fittings, etc.) not indicated to be salvaged. Backfill and compaction shall conform to standards set forth in the specifications.

**SECTION 3500  
METHOD OF MEASUREMENT**

**3500-1 CONTRACT ADMINISTRATION**

3500-1.1 Staking/Survey Requirements:

Payment for survey control, staking and grading of water main, force main, valves, fittings, fire hydrants, and structures is included in quantities associated with pipes, valves, and appurtenances.

3500-1.2 Testing:

Payment for all testing is included in quantities associated with pipes, valves, and appurtenances.

3500-1.3 Coordination of Utilities:

Payment for coordination with utility owners is included in quantities associated with pipes, valves, and appurtenances.

3500-1.4 Record Data and As-builts:

Payment for maintaining accurate records of utility installation and certified as-built drawings is included in quantities associated with pipes, valves, and appurtenances.

**3500-2 UTILITY EXCAVATION, TRENCHING, AND BACKFILLING**

3500-2.1 Utility Trenching, Bedding, and Backfilling:

Utility trenching, bedding and backfilling for installation of new water and sewer utility lines, valves and appurtenances is included in quantities associated with pipes, valves, and appurtenances.

3500-2.2 Roadway and Pavement Restoration:

Repair of pavement or roadway surfaces resulting from the installation of water and sewer utilities is already being repaired or replaced due to roadway work under roadway Project ID #238395-4-52-01. All roadway and pavement surfaces being removed, damaged or cut is in association with the roadway project and is not included quantities for this utility project.

**3500-3 PIPES, FITTINGS, VALVES, AND APPURTENANCES**

3500-3.1 Delivery of Salvageable Material to FDOT:

The delivery of salvaged valves and fire hydrant assemblies to the City of Fruitland Park Public Works yard will be paid as Lump Sum (LS).

3500-3.2 Utility Pipe, Water/Sewer:

The quantity to be paid for will be the length, in feet, to the nearest foot,

furnished, placed, tested, and accepted. Measurement shall be made along the horizontal projection of the centerline of pipe. For pipe up to 7.9" in diameter, payment includes all fittings. For pipes 8" and larger in diameter, fittings will be paid separately. Work includes all pipe restraining devices as detailed on plans, labor, materials, and incidentals.

3500-3.3 Utility Pipe, Remove & Dispose:

Excavation or trenching for the removal of a water or sewer utility is incidental to construction of the storm sewer system associated with Roadway Project ID #238395-4-52-01. No additional payment for excavation to remove designated water or sewer utility. The quantity to be paid for will be the length, in feet, to the nearest foot, of utility pipe removed and disposed. Measurement shall be made along the horizontal projection of the centerline of pipe. For all pipe sizes, payment includes removal and disposal of all valves, fittings, and appurtenances not specified to be salvaged.

3500-3.4 Fittings:

The quantity to be paid for will be the actual number of fittings furnished and installed, measured as "each", for pipes 8" and larger in diameter. For fittings on pipes up to 7.9" in diameter, fittings are included in the pipe cost. Work includes all labor, material, and incidentals.

3500-3.5 Utility Structure:

The quantity to be paid for will be the actual number of structures furnished and installed, measured as "each". The concrete vault or utility structure includes all appurtenances as detailed on the plans. Work includes all labor, materials, and incidentals.

3500-3.6 Tapping Saddle/Sleeve:

The quantity to be paid for will be the actual number of tapping saddles furnished and installed, measured as "each". Tapping saddles include poly tubing, corporation stops, curb stops, labor, materials, and incidentals.

3500-3.7 Backflow Assembly:

The quantity to be paid for will be the actual number of backflow assemblies/temporary jumper connections furnished, installed and removed, upon completion and acceptance of a water utility segment, measured as "each". Work includes all labor, materials, and incidentals.

3500-3.8 Valves:

The quantity to be paid for will be the actual number of valves, valve boxes, and concrete valve collars, furnished and installed, measured as "each". Work includes all labor, materials, and incidentals.

3500-3.9 VAC/AIR Assembly:

The quantity to be paid for will be the actual number of VAC/AIR assemblies

furnished, and installed, measured as "each". The VAC/AIR assembly includes all appurtenances as detailed on the plans. Work includes all labor, material, and incidentals.

3500-3.10 Relocate Utility Fixture:

The quantity paid for will be the actual number of water meters and meter boxes relocated, measured as "each". Relocation of each water meter and meter box includes careful removal from conflict location, placed at the plan specified location, per plan detail, and connection to the new service line. Work includes all labor, material, and incidentals.

3500-3.11 Adjust and Modify Utility Fixture:

The quantity paid for will be the actual number of water and sewer valve boxes adjusted or modified to new finished grades, measured as "each". Each valve box requiring adjustment or modification will comply with plan detail for installation of new box. Work includes all labor, materials, and incidentals.

3500-3.12 Remove and Dispose Utility Fixtures:

The quantity paid for will be the actual number of water valves and boxes removed for 8" and larger pipe diameter, measured as "each". This is for removal of valves and boxes only, contractor is to salvage and deliver water valves and boxes to City of Fruitland Park as described in Section 3500-3.1, Delivery of Salvageable Material.

3500-3.13 Fire Hydrant Assemblies:

The quantity to be paid for will be the actual number of fire hydrant assemblies furnished, installed and accepted, measured as "each". A fire hydrant assembly includes all fittings and appurtenances as detailed on the plans. Work includes all labor, materials, and incidentals.

3500-3.14 Fire Hydrant, Salvage and Store:

The quantity to be paid for will be the actual number of fire hydrant assemblies removed and stored, measured as "each". Contractor is to exercise care as not to damage each fire hydrant assembly during removal and storage. Delivery of salvaged fire hydrant assemblies to the City of Fruitland Park will be as described in Section 3500-3.1, Delivery of Salvageable Material. Work includes all labor and incidentals.

3500-3.15 Fire Hydrant, Adjust and Modify:

The quantity to be paid for will be the actual number of fire hydrants adjusted to grade, measured as "each". Contractor is to adjust fire hydrant and valve box to grade as detailed on plans for new hydrant installation. Work includes all labor, materials, and incidentals.

**SECTION 3600  
BASIS OF PAYMENT**

**3600-1 CONTRACT ADMINISTRATION**

Staking/survey requirements, testing, coordination of utilities, record data, as-builts and contractor warranty will not be paid for separately. The contractor shall include the cost for all Contract Administration items in the Contract unit price for pipes, valves, fittings and appurtenances.

**3600-2 UTILITY EXCAVATION, TRENCHING, AND BACKFILLING**

3600-2.1 Utility Trenching, Bedding, and Backfilling:

The contractor shall include the cost of utility trenching, bedding and backfilling in the Contract unit price for pipes, valves, fittings and appurtenances.

**3600-3 PIPES, FITTINGS, VALVES, AND APPURTENANCES**

3600-3.1 Delivery of Salvageable Material to FDOT:

Price and payment will be full compensation at the Contract unit price for all work to deliver salvaged valves, valve boxes and fire hydrant assemblies to the City of Fruitland Park Public Works yard and off load in location designated by the City.

3600-3.2 Utility Pipe, Water/Sewer:

Price and payment will be full compensation at the Contract unit price for all work and materials required to complete installation of water and sewer pipe in an acceptable manner. The cost of the pipe will also include all survey, testing, utility coordination, record data, as-builts, warranty, trenching, bedding, backfilling, dewatering, compaction, borrow, pipe restraints and includes all labor materials and incidentals. For 7.9" diameter pipe and smaller, the cost of pipe will also include all fittings.

3600-3.3 Utility Pipe, Remove & Dispose:

Excavation or trenching for the removal of a water or sewer utility is incidental to construction of the storm sewer system associated with Roadway Project ID #238395-4-52-01. No payment will be made for excavation to remove designated water or sewer utility. Price and payment will be full compensation at the Contract unit price for all work to remove and dispose of utility pipe, fittings, and appurtenances.

3600-3.4 Fittings:

Price and payment will be full compensation at the Contract unit price for all work and materials required to complete installation of 8" and larger utility fittings in an acceptable manner. The cost of the fittings will also include all survey, testing, utility coordination, record data, as-builts, warranty, trenching, bedding, restraints, backfilling, compaction, borrow, and includes all labor materials and incidentals.

3600-3.5 Utility Structure:

Price and payment will be full compensation at the Contract unit price for all work and materials including concrete, steel, reinforcement, hardware, inserts and other materials as required to fabricate, transport and place the product into its permanent position in an acceptable manner. The cost of concrete vault or utility structure includes all appurtenances as detailed on the plans, survey, testing, record data, as-builts, warranty, excavation, bedding, dewatering, backfill, compaction, borrow, labor, materials and incidentals.

3600-3.6 Tapping Saddle/Sleeve:

Price and payment will be full compensation at the Contract unit price for all work and materials required to complete installation of tapping saddle/sleeve in an acceptable manner. The cost of each tapping saddle/sleeve will also include poly tubing, corporation stops, curb stops, survey, testing, record data, as-builts, warranty, excavation, bedding, dewatering, backfill, compaction, borrow, labor, materials, and incidentals.

3600-3.7 Backflow Assembly:

Price and payment will be full compensation at the Contract unit price for all work and materials required to complete installation and removal of backflow assembly/temporary jumper connections furnished, installed and removed in an acceptable manner.

3600-3.8 Valves:

Price and payment will be full compensation at the Contract unit price for all work and materials required to complete installation of water and sewer valves in an acceptable manner. The cost of the valves will also include all survey, testing, record data, as-builts, excavation, restraints, warranty, bedding, backfilling, compaction, borrow, labor, materials, and incidentals.

3600-3.9 VAC/AIR Assembly:

Price and payment will be full compensation at the Contract unit price for all work and materials required to complete installation of VAC/AIR Assembly in an acceptable manner. The cost of AIR/VAC assembly includes all appurtenances as detailed on the plans, survey, testing, record data, as-builts, warranty, bedding, restraints, backfill, compaction, borrow, labor, materials and incidentals.

3600-3.10 Relocate Utility Fixture:

Price and payment will be full compensation at the Contract unit price for all work and materials required to relocate water meters and meter in an acceptable manner. The cost to relocate includes removal from conflict location, placement at the plan specified location, installation per plan detail, and connection to the new service line from main and service line to customer and includes survey, testing, record data, as-builts, warranty, bedding, restraints, backfill, compaction, borrow, labor, material, and incidentals.

3600-3.11 Adjust and Modify Utility Fixture:

Price and payment will be full compensation at the Contract unit price for all work and materials required to adjust valve boxes or utility fixtures in an acceptable manner. The cost to adjust or modify a utility fixture includes adjustment to new finished grades, bedding, backfill, compaction, borrow, labor, materials, and incidentals.

3600-3.12 Remove and Dispose Utility Fixtures:

Price and payment will be full compensation at the Contract unit price for all work to remove utility fixtures, associated with pipe sizes 8" and larger, in an acceptable manner. The cost for this section is for removal of valves and boxes only, contractor is to salvage and deliver water valves and boxes to City of Fruitland Park as paid for in Section 3600-3.1, Delivery of Salvageable Material.

3600-3.13 Fire Hydrant Assemblies:

Price and payment will be full compensation at the Contract unit price for all work and materials required to complete installation of fire hydrant assemblies in an acceptable manner. The cost for each fire hydrant assembly includes all fittings and appurtenances as detailed on the plans, survey, testing, record data, as-builts, warranty, bedding, restraints, backfill, compaction, labor, materials, and incidentals.

3600-3.14 Fire Hydrant, Salvage and Store:

Price and payment will be full compensation at the Contract unit price for all work required for removal of a fire hydrant assembly in an acceptable manner. The cost for removal includes labor, backfill, compaction, removal and storage. Delivery of salvaged fire hydrant assemblies to the City of Fruitland Park will be paid for as described in Section 3600-3.1, Delivery of Salvageable Material.

3600-3.15 Fire Hydrant, Adjust and Modify:

Price and payment will be full compensation at the Contract unit price for all work and materials required to adjust fire hydrants and valve boxes to new finished grades in an acceptable manner. The cost to adjust or modify a fire hydrant and valve box includes adjustment to new finished grades, survey, testing, record data, as-builts, warranty, bedding, restraints, compaction, borrow, labor, materials, and incidentals.

**TRAFFIC CONTROL NOTES:**

1. THE CONTRACTOR SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI (2009), THE FDOT DESIGN STANDARD INDICES (SERIES 600), AND THE FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AS APPLICABLE (2015). IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DEVELOP AND MAINTAIN A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH THIS CRITERIA. SPECIAL ATTENTION TO DROP-OFF REQUIREMENTS IN INDEX 600.
2. THE CONTRACTOR SHALL SUBMIT DETAILED MAINTENANCE OF TRAFFIC PLANS FOR REVIEW AND APPROVAL BY LAKE COUNTY. COST OF THIS WORK SHALL BE INCLUDED IN THE CONTRACTORS BID PRICE FOR MAINTENANCE OF TRAFFIC.
3. ALL LANES MUST BE OPEN FOR TRAFFIC DURING AN EVACUATION NOTICE OF A HURRICANE OR OTHER CATASTROPHIC EVENTS AND SHALL REMAIN OPEN FOR THE DURATION OF THE EVACUATION OR EVENT AS DIRECTED BY LAKE COUNTY.
4. THE CONTRACTOR IS TO MAINTAIN AND KEEP STREET NAME IDENTIFICATION VISIBLE DURING CONSTRUCTION OPERATIONS, IN ORDER TO FACILITATE EMERGENCY VEHICLE TRAFFIC.
5. ACCESS TO BUSINESS AND RESIDENTIAL DRIVEWAYS TO BE PROVIDED FOR AT ALL TIMES.
6. MINIMUM POSTED SPEED SHALL BE 25 MPH.
7. MINIMUM LANE WIDTH SHALL BE 10'.

**PHASE I**

1. MAINTAIN TRAFFIC ON EXISTING PAVEMENT AND INSTALL PHASE I TEMPORARY SIGNING.
2. CONSTRUCT TEMPORARY PAVEMENT REQUIRED FOR PHASE II TRAFFIC CONTROL USING TRAFFIC CONTROL MEASURES DESCRIBED IN STANDARD INDEX 603. REMOVE CONFLICTING EXISTING PAVEMENT MARKINGS AND INSTALL TEMPORARY SIGNING AND PAVEMENT MARKINGS.
3. PROJECT CLEARING AND GRUBBING, PROJECT RIGHT-OF-WAY STAKING, PROJECT EROSION AND SEDIMENT CONTROL, CONSTRUCT PONDS, EMBANKMENT STATION 162+00 TO STATION 171+00, LEFT, CONSTRUCT POTABLE WATER MAIN, CONSTRUCTION SANITARY SEWER FORCE MAIN, STORM SYSTEM CONSTRUCTION STATION 162+50 TO STATION 171+00, LEFT, AND NEW WEST BOUND ROADWAY CONSTRUCTION STATION 162+00 TO STATION 171+00, LEFT.
4. CORRDINATE UTILITY RELOCATION BY OTHERS.

**PHASE II**

1. SHIFT TRAFFIC TO EXISTING AND TEMPORARY PAVEMENT.
2. STORM SYSTEM CONSTRUCTION STATION 158+00 TO STATION 171+00, RIGHT, AND NEW EAST BOUND ROADWAY CONSTRUCTION.

**PHASE III**

1. INSTALL TEMPORARY SIGNING AND PAVEMENT MARKINGS. SHIFT TRAFFIC TO NEWLY CONSTRUCTED EASTBOUND PAVEMENT.
2. CONSTRUCT NEW PAVEMENT (EXCLUDING FRICTION COURSE), CURB AND GUTTER, GRADING, MEDIAN AND ALL OTHER REMAINING CONSTRUCTION USING TRAFFIC CONTROL MEASURES DESCRIBED IN STANDARD INDEX 602.

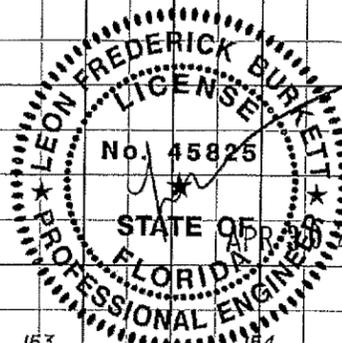
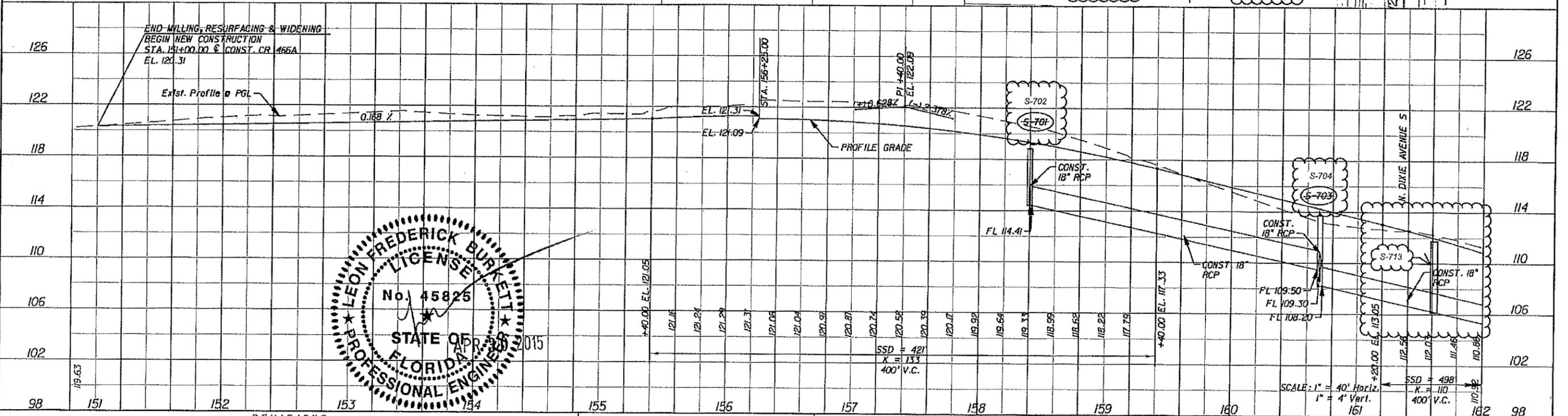
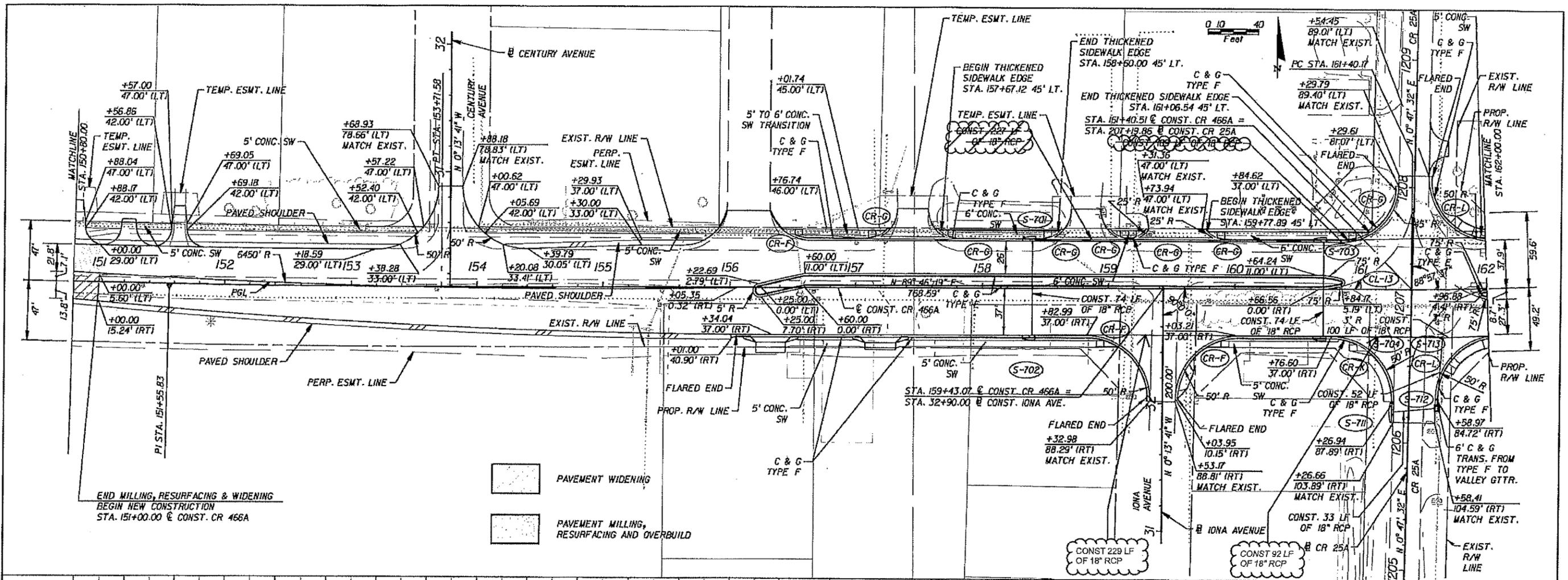
**PHASE IV**

1. INSTALL TEMPORARY PAVEMENT MARKINGS AND PERMANENT SIGNING.
2. MAINTAIN TRAFFIC ON NEW PAVEMENT.
3. CONSTRUCT FRICTION COURSE USING TRAFFIC CONTROL MEASURES DESCRIBED IN STANDARD INDEX 613.
4. INSTALL PERMANENT RPM'S AND PAVEMENT MARKINGS.
5. REMOVE CONSTRUCTION SIGNING.

**US 27/441**

1. MAINTAIN TRAFFIC ON EXISTING PAVEMENT AND INSTALL TEMPORARY SIGNING.
2. CONDUCT MILLING, RESURFACING AND PAVEMENT MARKING OPERATION UTILIZING LANE CLOSURES.
3. THERE ARE NO LANE CLOSURE RESTRICTIONS.

REVISIONS				<b>TIERRA, INC.</b> 591 Susan B. Britt Court   Winter Garden, Florida 34787 T 407-877-1354   F 407-654-7347   C 407-461-1564 <a href="http://www.tierraeng.com">www.tierraeng.com</a>   <a href="mailto:rudd@tierraeng.com">rudd@tierraeng.com</a> Certification of Authorization No 6486 geotechnical environmental materials engineering	<b>COUNTY ROAD 466A</b> <b>PHASE I</b> <b>LAKE COUNTY, FL</b>	<b>PHASING PLAN</b>	ROBERT P. RUDD, P.E. LICENSE NO. 51496 12/29/2015	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION					35
2	ADDENDUM #2, PHASING PLAN	02/01/16						



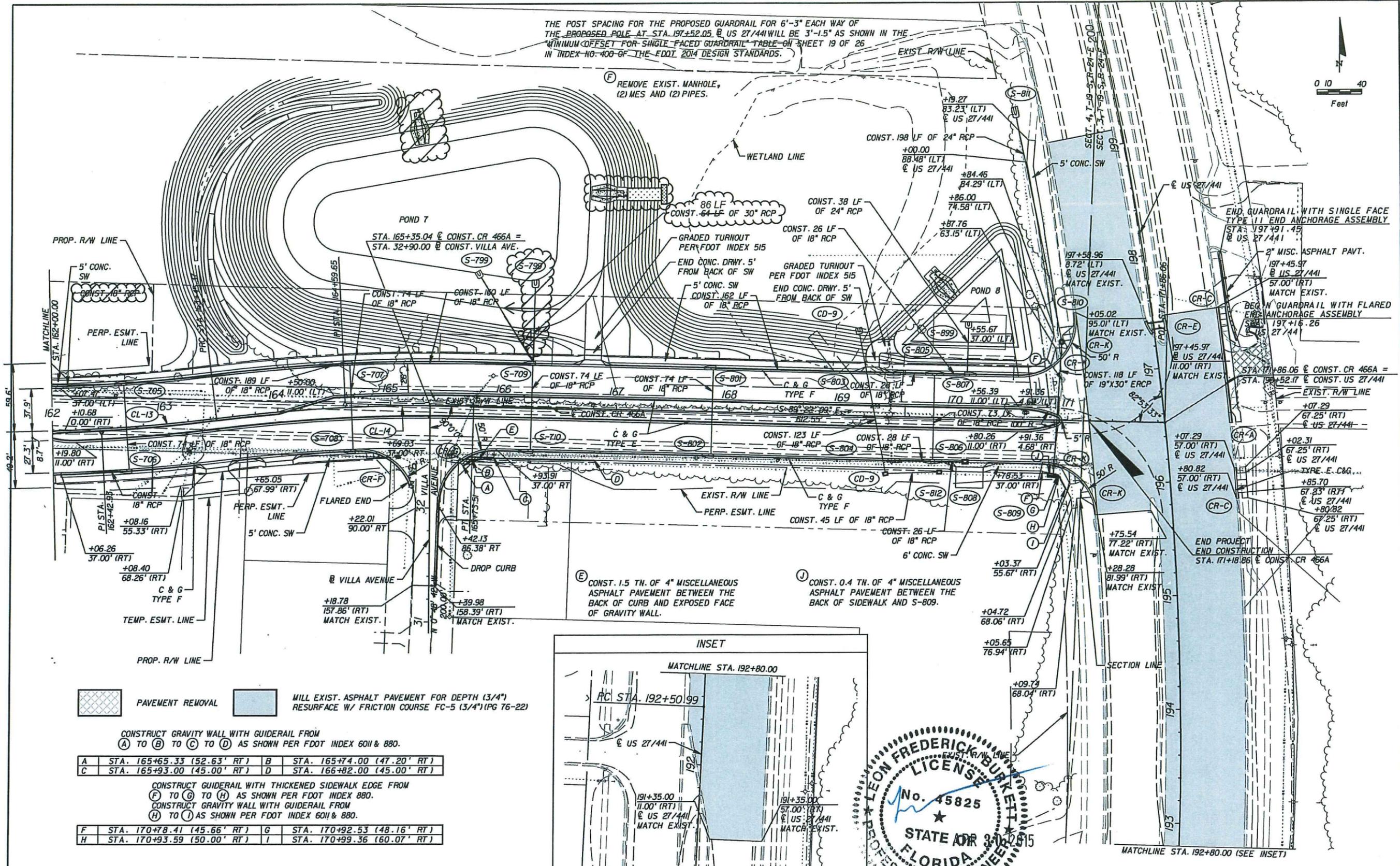
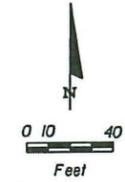
REVISIONS			
DATE	BY	DESCRIPTION	
02/01/16	2	ADDENDUM #2, STORM CHANGES	

**Kimley»Horn**  
 Certificate of Authorization No. 696  
 L. Frederick Burkett, P.E.  
 P.E. License No. 45825  
 3660 Maguire Boulevard, Suite 200  
 Orlando, Florida 32803

**COUNTY ROAD 466A**  
**PHASE 1**  
**LAKE COUNTY, FL**

**PLAN-PROFILE (02)**  
 SHEET NO. 13

THE POST SPACING FOR THE PROPOSED GUARDRAIL FOR 6'-3" EACH WAY OF THE PROPOSED POLE AT STA. 197+52.05 @ US 27/441 WILL BE 3'-1.5" AS SHOWN IN THE MINIMUM OFFSET FOR SINGLE FACED GUARDRAIL TABLE ON SHEET 19 OF 26 IN INDEX NO. 400 OF THE FDOT 2014 DESIGN STANDARDS.

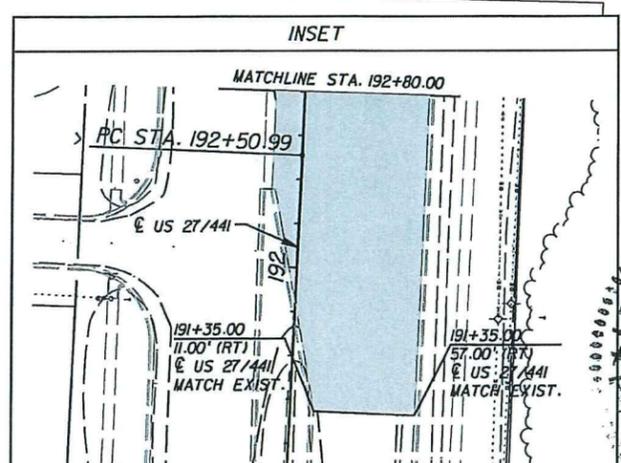


- PAVEMENT REMOVAL
- WILL EXIST. ASPHALT PAVEMENT FOR DEPTH (3/4") RESURFACE W/ FRICTION COURSE FC-5 (3/4") (PG 76-22)
- CONSTRUCT GRAVITY WALL WITH GUIDERAIL FROM (A) TO (B) TO (C) TO (D) AS SHOWN PER FDOT INDEX 6011 & 880.
 

A	STA. 165+65.33 (52.63' RT)	B	STA. 165+74.00 (47.20' RT)
C	STA. 165+93.00 (45.00' RT)	D	STA. 166+82.00 (45.00' RT)
- CONSTRUCT GUIDERAIL WITH THICKENED SIDEWALK EDGE FROM (F) TO (G) TO (H) AS SHOWN PER FDOT INDEX 880.
 

F	STA. 170+78.41 (45.66' RT)	G	STA. 170+92.53 (48.16' RT)
H	STA. 170+93.59 (50.00' RT)	I	STA. 170+99.36 (60.07' RT)
- CONSTRUCT GRAVITY WALL WITH GUIDERAIL FROM (H) TO (I) AS SHOWN PER FDOT INDEX 6011 & 880.
 

H	STA. 170+93.59 (50.00' RT)	I	STA. 170+99.36 (60.07' RT)
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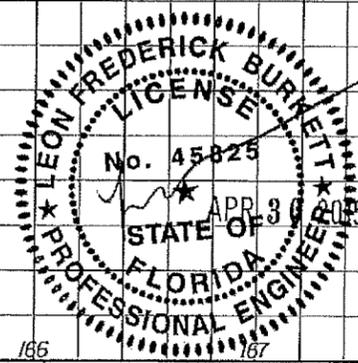
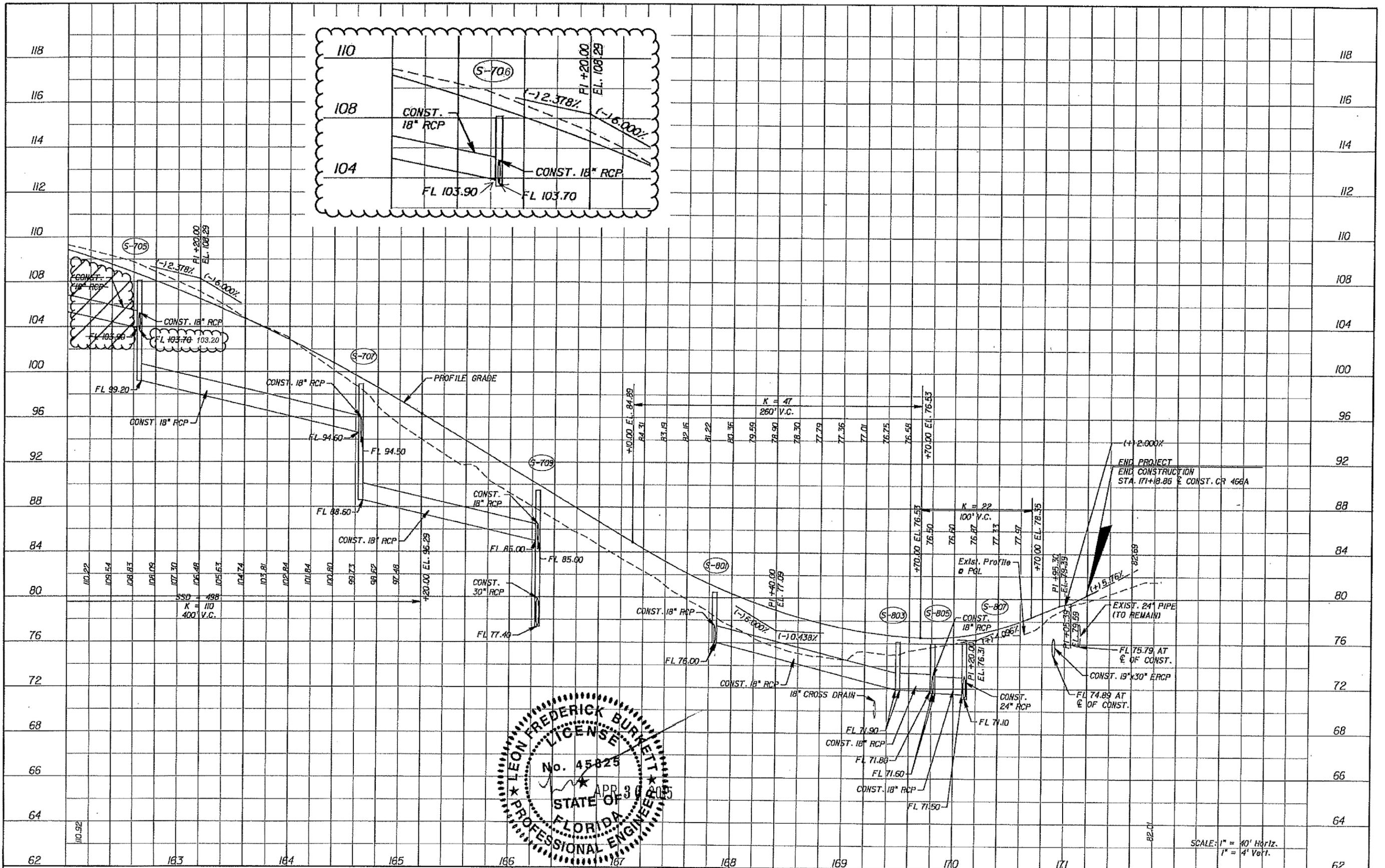
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
02/01/16	2	ADDENDUM #2, STORM CHANGES			

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 Orlando, Florida 32803

**COUNTY ROAD 466A**  
**PHASE 1**  
**LAKE COUNTY, FL**

**PLAN (03)**

SHEET NO. 14



REVISIONS			
DATE	BY	DESCRIPTION	
02/01/16	2	ADDENDUM #2, STORM CHANGES	

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**COUNTY ROAD 466A**  
**PHASE 1**  
**LAKE COUNTY, FL**

**PROFILE (04)**  
 SHEET NO. 15

~~S-701~~ S-702  
 STA. 158+39.89 ~~(RT.)~~ (Rt)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 118.81  
 FL 114.41 ~~(Rt.)~~, Ah.) (Lt)

~~S-702~~ S-701  
 STA. 158+39.89 ~~(RT.)~~ (Lt)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 118.81  
 FL 114.50 ~~(Rt.)~~ (Rt)

~~S-703~~ S-704  
 STA. 160+70.00 ~~(RT.)~~ (Rt)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 113.72  
 FL 109.30 ~~(Rt.)~~ (Lt)  
 FL 109.50 (Bk.)  
 FL 108.20 (Ah.)

~~S-704~~ S-703  
 STA. 160+70.00 ~~(RT.)~~ (Lt)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 113.72  
 FL 109.50 ~~(Rt.)~~ (Rt)

~~S-705~~ S-705  
 STA. 162+65.00 (LT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 108.13  
 FL ~~103.70~~ (Rt.) 103.20  
 FL 99.20 (Ah.)  
 FL ~~103.90~~ (Bk.)

~~S-706~~ S-706  
 STA. 162+65.00 (RT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 108.13  
 FL ~~103.90~~ (Lt.) 103.70  
 FL 103.90 (Bk)

~~S-707~~ S-707  
 STA. 164+65.00 (LT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 98.94  
 FL 88.60 (Ah.)  
 FL 94.50 (Rt.)  
 FL 94.60 (Bk.)

~~S-708~~ S-708  
 STA. 164+65.00 (RT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 98.94  
 FL 94.70 (Lt.)

~~S-709~~ S-709  
 STA. 166+25.00 (LT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 89.47  
 FL 85.00 (Bk., Rt.)  
 FL 77.40 (Lt.)

~~S-710~~ S-710  
 STA. 166+25.00 (RT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 89.47  
 FL 85.20 (Lt.)

~~S-711~~ S-711  
 STA. 161+25.55 (95.87' LT.)  
 CONST. INLET TYPE P-6  
 INDEX NO. 211  
 EOP EL. 111.84  
 FL 107.65 (Ah.)

~~S-712~~ S-712  
 STA. 161+60.15 (92.93' LT.)  
 CONST. INLET TYPE V  
 INDEX NO. 221  
 EOP EL. 111.60  
 FL 107.17 (Bk., Lt.)

~~S-713~~ S-713  
 STA. 161+64.87 (37.69' RT.)  
 CONST. MANHOLE TYPE P-7  
 INDEX NO. 200, 201  
 EOP EL. 111.37  
 FL 106.14 (Rt., Ah.) (Bk)

~~S-799~~ S-799  
 STA. 166+25.20 (107.30' LT.)  
 CONST. MES (1:2)  
 INDEX NO. 272  
 FL 76.00 (Rt.)

~~S-801~~ S-801  
 STA. 167+85.00 (LT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 80.48  
 FL 76.00 (Rt., Ah.)

~~S-802~~ S-802  
 STA. 167+85.00 (RT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 80.48  
 FL 76.20 (Lt.)

~~S-803~~ S-803  
 STA. 169+50.00 (LT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 76.14  
 FL 71.90 (Bk., Ah.)

~~S-804~~ S-804  
 STA. 169+50.00 (RT.)  
 CONST. INLET TYPE P-5  
 INDEX NO. 211  
 EOP EL. 76.14  
 FL 71.90 (Ah.)

~~S-805~~ S-805  
 STA. 169+81.23 (LT.)  
 CONST. INLET TYPE P-6  
 INDEX NO. 211  
 EOP EL. 75.98  
 FL 71.80 (Bk.)  
 FL 71.60 (Ah., Rt.)

~~S-806~~ S-806  
 STA. 169+81.23 (RT.)  
 CONST. INLET TYPE P-6  
 INDEX NO. 211  
 EOP EL. 75.98  
 FL 71.80 (Bk., Ah., Lt.)

~~S-807~~ S-807  
 STA. 170+10.00 (LT.)  
 CONST. INLET TYPE J-5  
 INDEX NO. 211  
 EOP EL. 76.19  
 FL 71.10 (Lt.)  
 FL 71.50 (Bk.)

~~S-808~~ S-808  
 STA. 170+10.00 (RT.)  
 CONST. INLET TYPE V  
 INDEX NO. 211  
 EOP EL. 76.19  
 FL 71.90 (Bk.)

~~S-809~~ S-809  
 STA. 170+88.08 (49.21' RT.)  
 CONST. STRAIGHT  
 CONCRETE ENDWALL  
 INDEX NO. 250  
 FL 76.30 (Lt.)

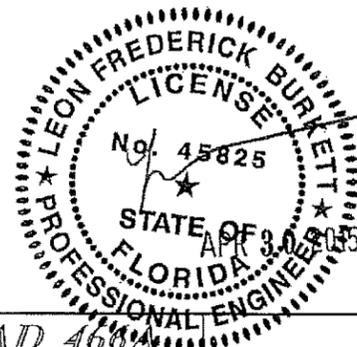
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 STA. 170+93.15 (68.98' LT.)  
 CONST. MANHOLE TYPE P-8  
 INDEX NO. 200, 201  
 RIM EL. 77.50  
 FL 73.00 (Lt., Rt.)

~~S-811~~ S-811  
 STA. 199+43.81 (89.82' LT.)  
 E US 27/441  
 CONST. MES (1:4)  
 INDEX NO. 273  
 FL 68.50 (Ah.)

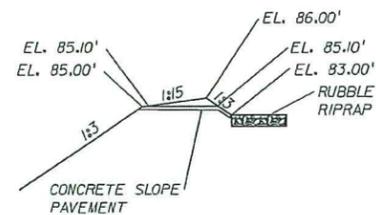
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 STA. 169+87.50 (47.91' RT.)  
 CONST. DBI TYPE C  
 INDEX NO. 232  
 INLET EL. 76.20  
 FL 69.88 (Bk.)

~~S-899~~ S-899  
 STA. 170+10.14 (80.94' LT.)  
 CONST. MES (1:2)  
 INDEX NO. 272  
 FL 68.00 (Rt.)

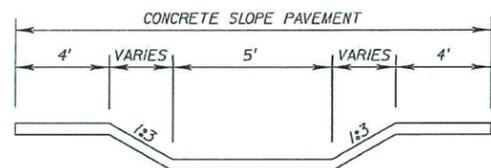
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 STA. 169+40.00 (50.50' RT.)  
 CONST. DBI TYPE C  
 INDEX NO. 232  
 INLET EL. 75.75  
 FL 69.65 (Lt., Ah.)  
 STA. 169+13.60 (73.58' LT.)  
 CONST. MES (1:2)  
 INDEX NO. 272  
 FL 69.00 (Rt.)



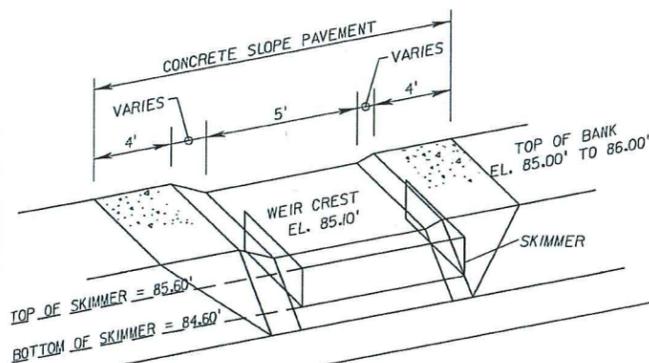
REVISIONS				Kimley»Horn <small>Certificate of Authorization No. 696          L. Frederick Burkett, P.E.          P.E. License No. 45825          3660 Maguire Boulevard, Suite 200          Orlando, Florida 32803</small>	COUNTY ROAD 460 PHASE 1 LAKE COUNTY, FL	DRAINAGE STRUCTURES	SHEET NO. 20
DATE	BY	DESCRIPTION	DATE				
02/01/16	2	ADDENDUM #2, STORM CHANGES					



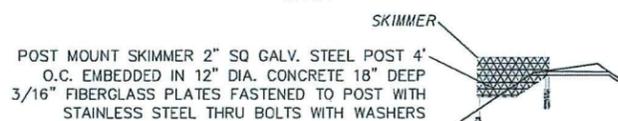
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(NTS)



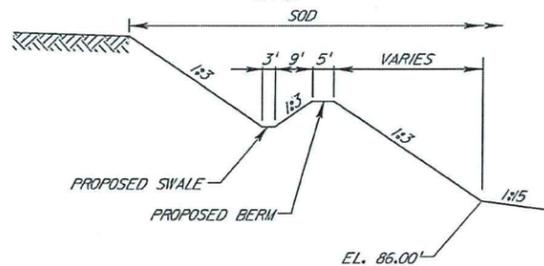
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(NTS)



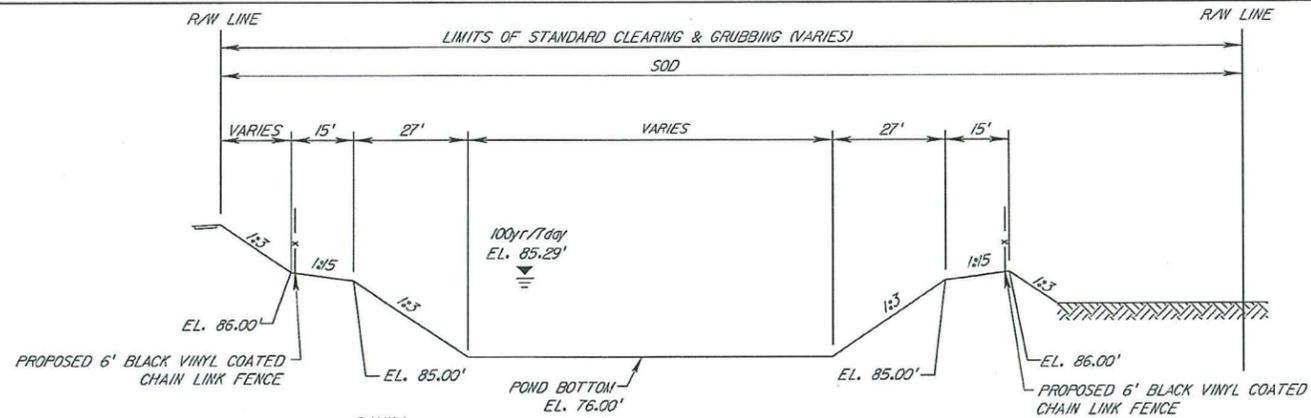
WEIR DETAIL  
(NTS)



SKIMMER DETAIL  
(NTS)

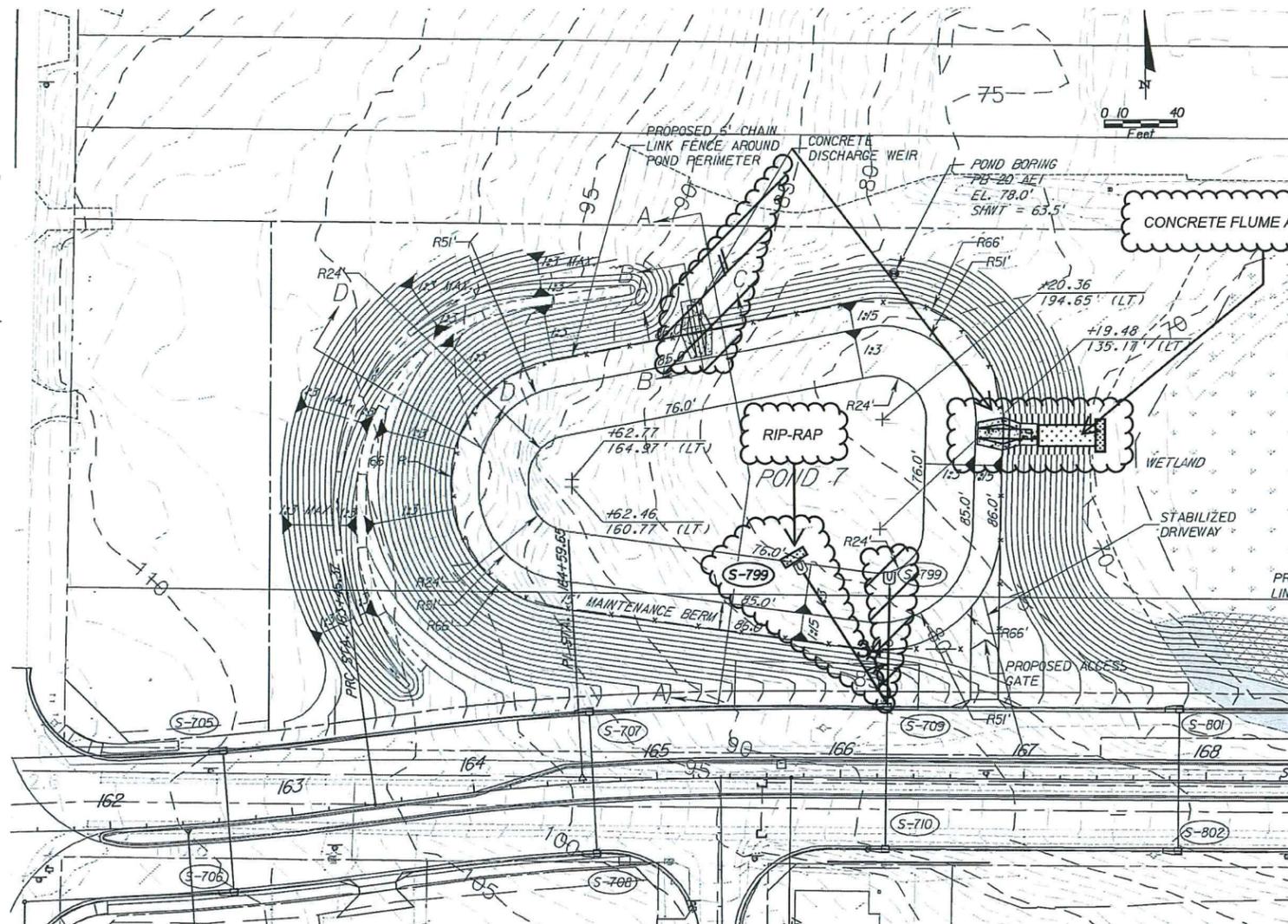


SECTION D-D  
N.T.S.



SECTION A-A  
N.T.S.

HYDRAULIC DATA	
S.H.W.L.	64.00'
D.H.W. <sub>10</sub>	80.14'



SEE SHEET 22 FOR CONTINUATION



- LEGEND
- WETLAND LIMITS
  - - - WETLAND BUFFER
  - DENOTES WETLAND
  - ▨ DENOTES PROPOSED WETLAND IMPACT (0.07 ACRES)
  - DENOTES PROPOSED BUFFER IMPACT (0.11 ACRES)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
02/01/16	RPR	2 ADDENDUM #2, STORM CHANGES			

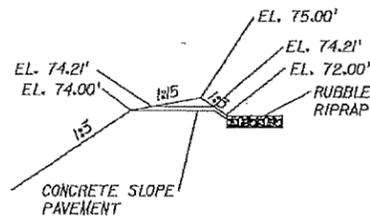
**Kimley»Horn**

Certificate of Authorization No. 696  
L. Frederick Burkett, P.E.  
License No. 45825  
3660 Maguire Boulevard, Suite 200  
Orlando, FL 32803-3062

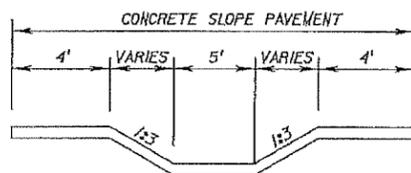
COUNTY ROAD 466A  
PHASE I  
LAKE COUNTY, FLORIDA

POND 7  
LAYOUT

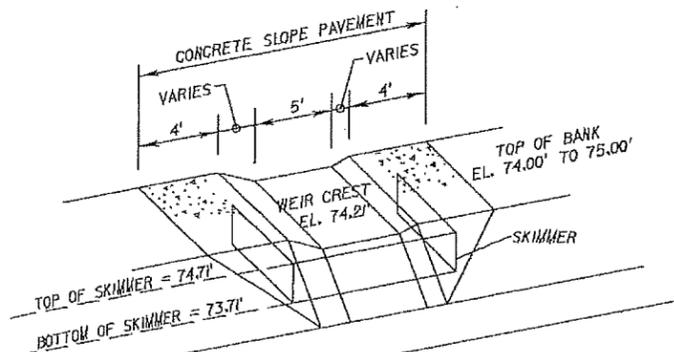
SHEET NO.  
21



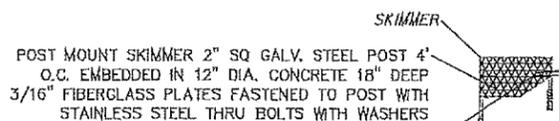
SECTION B-B  
(NTS)



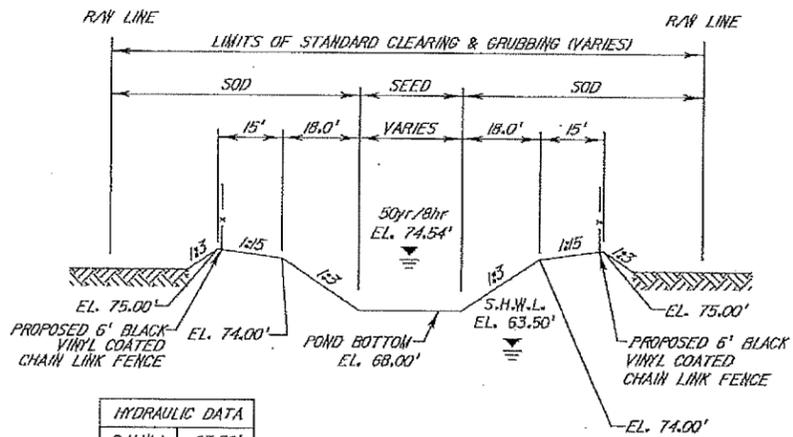
SECTION C-C  
(NTS)



WEIR DETAIL  
(NTS)

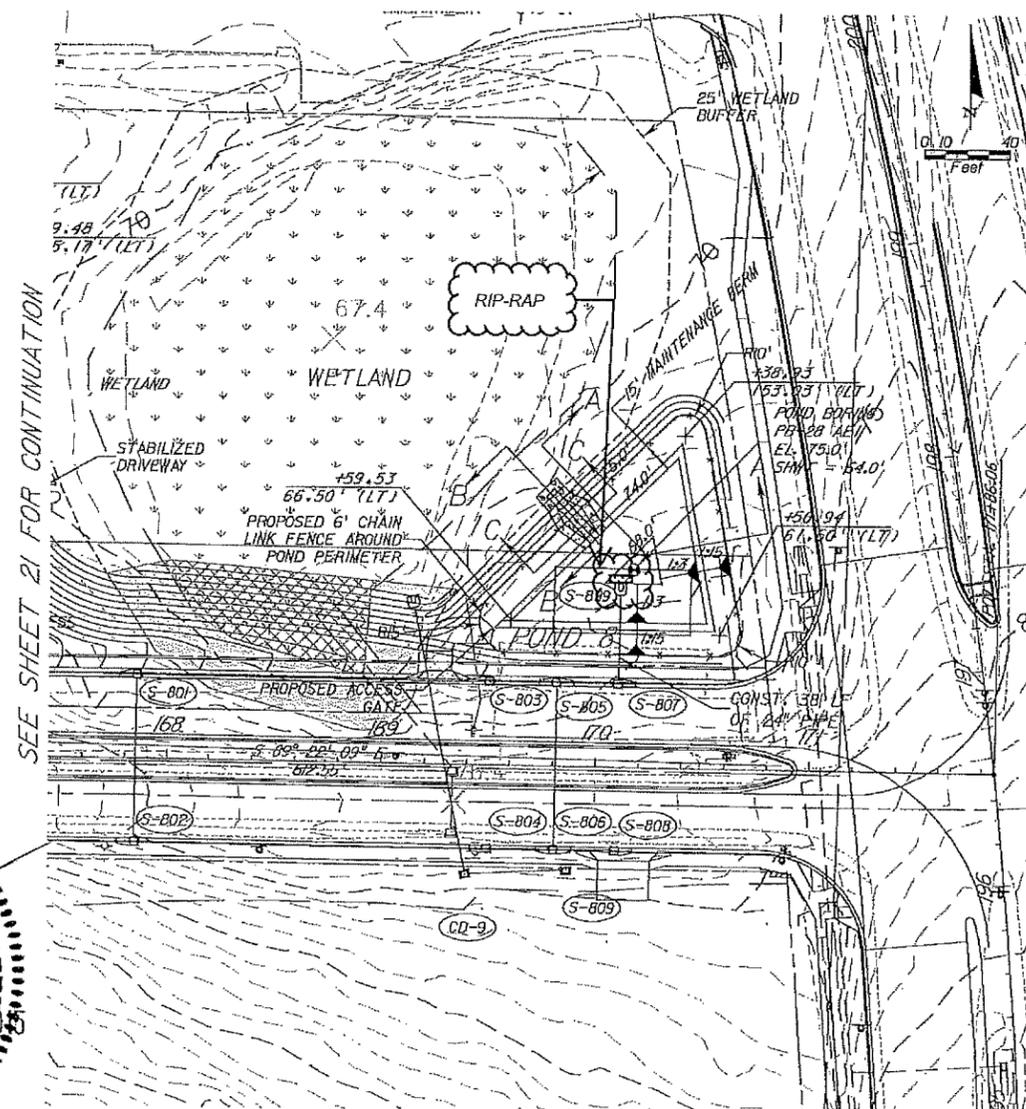


SKIMMER DETAIL  
(NTS)



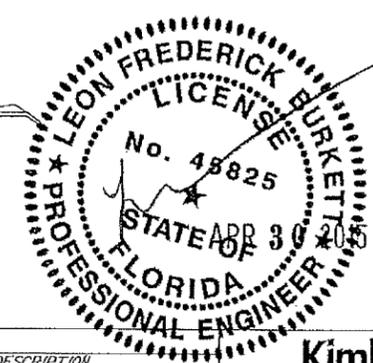
SECTION A-A  
N.T.S.

HYDRAULIC DATA	
S.H.W.L.	63.50'
D.H.W. <sub>10</sub>	74.32'



- LEGEND:**
- WETLAND LIMITS
  - WETLAND BUFFER
  - DENOTES WETLAND
  - DENOTES PROPOSED WETLAND IMPACT (0.07 ACRES)
  - DENOTES PROPOSED BUFFER IMPACT (0.11 ACRES)

SEE SHEET 21 FOR CONTINUATION



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
02/01/16	RPR	ADDENDUM #2, STORM CHANGES			

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COUNTY ROAD 466A  
 PHASE I  
 LAKE COUNTY, FLORIDA

POND 8  
 LAYOUT

SHEET NO.  
 22